43/2

Existing Winter Use Management Guidelines, Inventory, and Needs

Yellowstone National Park

March 1989

READEX FICHE best copy available

I 29.9/2:

CONTENTS

Executive Summary

Chapter 1 INTRODUCTION 1

- Purpose and Need 1
- Scope 1
- Time Frame and Revision 1
- Compliance Information 1

Chapter 2 LEGISLATION AND POLICY GUIDANCE 3

Chapter 3 DESCRIPTION OF THE ENVIRONMENT 6

- General 6
- Regional Setting 6
- Natural Resources 6
- Climate and Weather 7
- History of Winter Use 7

Chapter 4 EXISTING MANAGEMENT GOALS 12

- Resource Protection 12
  - Natural Resources 12
  - Cultural Resources 12
  - Visitor Experience 12
- Visitor Uses 12
- Access 12
  - Roads and Snowroads 14
  - Trails 14
  - Handicapped Access 14
- Facilities and Services 14
  - Overnight Facilities 14
  - Guiding and Use of Fixed Base Camps 14
  - Other Facilities and Services 14
- Interpretation and Visitor Information 16
- Visitor Protection and Safety 16

Chapter 5 EXISTING MANAGEMENT POLICIES 18

- Resource Protection 18
  - Natural Resources 19
  - Cultural Resources 20
  - Visitor Experience 20
- Visitor Uses 20
- Access 21
  - Roads and Snowroads 21
  - Trails 21
  - Handicapped Access 22
- Facilities and Services 22
  - Advertising and Promotion 22
  - Overnight Facilities 22
  - Guiding and Fixed Base Camps 23
  - Other Facilities and Services 23

Interpretation and Visitor Information 23
Visitor Protection and Safety 24

Chapter 6 MANAGEMENT ZONES 26

Developed Area Zone 26
Guidelines
Resource Protection 26
Visitor Uses and Access 26
Facilities and Services 26
Interpretation and Visitor Information 29
Visitor Protection and Safety 29
Specific Areas 29
Mammoth 29
Madison 29
Old Faithful 29
Grant 29
West Thumb 29
Lake Village/Bridge Bay 29
Fishing Bridge 30
Canyon 30
Tower/Roosevelt 30
Roads 30
Snowroads 30
Threshold Zone 30
Guidelines 30
Resource Protection 30
Visitor Uses and Access 30
Facilities and Services 31
Interpretation and Visitor Information 31
Visitor Protection and Safety 31
Specific Areas 31
Mammoth 31
Norris 31
Madison 31
West Entrance 31
Fountain Paint Pots 31
Old Faithful 31
West Thumb 31
East Entrance 31
Mud Volcano 31
Canyon 31
Tower/Roosevelt 31
Northeast 32
Backcountry Zone 32
Resource Protection 32
Visitor Uses and Access 32
Facilities and Services 32
Interpretation and Visitor Information 32
Visitor Protection and Safety 32

Chapter 7 CURRENT WINTER OPERATION, DEFICIENCIES AND POTENTIAL NEEDS 34

National Park Service Operations 34
Resource Management and Visitor Protection 34
Maintenance 35

Interpretation 35
Research 36
National Park Service Operation Summary 37
Facilities and Services 37
Facilities 37
Transportation Services 39
Emergency Services 40
Winter Program Operations Summary 40

Chapter 8 FUTURE PLANNING 42

Purpose and Need for A Winter Use Plan 42
Issues 42
Resource Protection 42
Visitor Uses and Access 43
Facilities and Services 43
Interpretation and Visitor Information 44
Visitor Protection and Safety 44
Public Participation 44
Stage I: Scoping 45
Stage II: Alternative Formulation 45
Stage III: Draft Plan/Environmental Assessment 45

APPENDICES

1. Chronology of Winter Use 46
2. Detailed Budget Information: NPS Operations and Facilities and Services 48
3. Research and Resource Monitoring Needs 56
4. Sensitive Resource Areas and Current Management Measures 58
5. Snowroad Grooming and Signing Guidelines 62
6. Winter Road Maintenance and Signing Guidelines 64
7. Path, Boardwalk and Overlook Maintenance Guidelines 66
8. Ski Trail Maintenance Guidelines 68
9. Ski Trail Map Standards 70
10. Backcountry Procedures and Winter Checklist 72
11. Commercial Use Permit and Conditions 76

LIST OF FIGURES

1. Regional Map Showing Yellowstone National Park and the Surrounding Communities. 8
2. Winter Visitation, December 1 - March 31, 1973 - 1988 (graph) 9
3. Winter Visitor Traffic by Entrance Gate, December 1 - March 31, 1979/80 - 1987/88 (graph) 11
4. Existing Winter Facilities and Services (map) 13
5. Visitor Use of Winter Overnight Accommodations, 1977/78 - 1987/88 (graph) 15
6. Identified Critical Winter Wildlife Habitat (map) 27
7. Land Use Classification (map) 28

CHAPTER 1 INTRODUCTION

PURPOSE AND NEED

A winter use management policy is necessary for Yellowstone National Park because winter use has increased significantly and management issues and use impacts differ substantially from summer operations. This visitor use is due, in part, to continuing trends in recreational interests such as cross-country skiing, snowmobiling, and outdoor recreation in general, as well as trends toward increased leisure time and off-season travel.

Winter use in Yellowstone has had a dramatic increase since the mid-1960s, when the snowmobile was developed. Since that time, the National Park Service's responses to increasing winter use have been incremental. As new uses and increased levels of use appeared, park staff attempted to accommodate or control them in accordance with established National Park Service policies and practices. As new services or improved and expanded services were needed for visitors, provisions were often make-shift, as existing facilities were not designed for winter use, and managers were reluctant to make substantial investments when there was no way to know whether significant winter use would be a lasting trend or not. Most importantly, as winter use increased, environmental impacts of increasing winter use were not being adequately assessed.

Now, after 20 years, it is evident that winter use is well established and needs to be integrated into park management planning. Existing practices for winter use need to be examined and policies and plans that provide direction for the foreseeable future must be developed.

This document is a compilation of existing winter use policies and plans that are currently providing direction to Yellowstone's managers. It will provide the necessary foundation for the park's systematic planning approach toward winter use, and will culminate in a winter use plan.

SCOPE

This is a descriptive document containing current winter goals and management policies for park operations. Deficiencies and areas of concern that require thorough analysis are also addressed. This document will serve as a baseline report for a joint winter use planning effort that was recently initiated for Yellowstone, Grand Teton, and John D. Rockefeller, Jr. Memorial Parkway. A joint plan is being prepared because winter use at the three areas is closely related and the State of Wyoming recently proposed a long distance snowmobile trail connecting Yellowstone and Grand Teton with existing trail systems in the Togwotee Pass - Green River area. The joint plan will analyze deficiencies and areas of concern presented in this document and issues raised by the public and other agencies during the public involvement process.

TIME FRAME AND REVISION

Existing management direction illustrated in this report is expected to be effective for a period of two years, or until completion of the joint winter use plan.

COMPLIANCE INFORMATION

This report is a descriptive document. Any new construction identified in this report has been proposed in other plans, or will be subject to further planning and compliance as required by NPS policy and guidelines prior to implementation.

page 2 is blank

CHAPTER 2 LEGISLATION AND POLICY GUIDANCE

This report compiles current winter use management goals and policies from existing National Park Service policy. This section references National Park Service legislation and policy directing current winter operations. Although the legislation and policy guidance contained herein may appear to be general in scope, it is directly related to winter operations in Yellowstone.

ACTS OF CONGRESS

The Act of March 1, 1872 (17 Stat. 32), establishing Yellowstone National Park, states that it is "dedicated and set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people" and "for the preservation from injury or spoliation of all timber, mineral deposits, [and] natural curiosities or wonders...and their retention in their natural condition."

The Act of August 25, 1916 (PL 64-235, 39 Stat. 535 16 U.S.C. §§ 1,2-4, as amended), establishing the National Park Service, states its basic mission:

> "To conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The Wilderness Act of 1964 (PL 88-577, 78 Stat. 890, 16 U.S.C. 1311 et. seq.) and Yellowstone's subsequent Wilderness Recommendation (1972) require that areas proposed for inclusion in the National Wilderness Preservation System be managed so as not to preclude their eventual designation.

The Endangered Species Act of 1973, as amended, (PL 93-205 87 Stat. 884, 16 U.S.C. 1531 et. seq.) requires the park to identify threatened and endangered species and their critical habitat requirements; to "seek to conserve" said species, using "all methods and procedures...to bring any endangered or threatened species to the point at which measures...are no longer necessary"; and to consult with the U.S. Fish and Wildlife Service and receive a "No Jeopardy" opinion on management actions that could affect listed species.

The National Historic Preservation Act of 1966 as amended (PL 89-665, 80 Stat. 915, 16 U.S.C. § 470 et. seq.,) mandates that the park identify significant historic and cultural resources and consider the effects of proposed actions on those resources.

EXECUTIVE ORDERS

E.O. 11644 requires Federal Agencies to develop regulations for use of off-road vehicles. Areas and trails within units of the National Park System can be used only if the Agency head determines that off-road vehicle use will not adversely affect natural, aesthetic, or scenic values.

NATIONAL PARK SERVICE MANAGEMENT POLICIES (1988)

Overnight Accommodations

"The Service will provide needed visitor facilities for the use and enjoyment of the park. The location of many parks is such that visitors need overnight accommodations in or near the park in order to enjoy their visit. Overnight facilities will be restricted to the kinds and minimum levels necessary to achieve each park's purpose consistent with the protection of park resources and will be provided only when the private sector or other public agencies cannot adequately provide for them in the park vicinity. Where overnight accommodations are to be provided in a park, the concessioners shall maintain a reasonable proportion of their accommodations at low prices."

Recreational Activities

"The Service encourages those recreational activities which draw their meaning from association with, and direct relation to park resources, and which are consistent with the protection of such resources. Recreation uses which do not fit the above description may be provided in certain areas under careful regulation and control..."

Wilderness Management

"Administrative use of motorized equipment or mechanical transport, including motorboats and aircraft, is permitted only as follows:

-In emergency cases involving the health and safety of wilderness users or the protection of wilderness values.

-As necessary to meet the minimum needs of management to achieve the purpose of the area."

"Structures or facilities in support of commercial services are not permitted in wilderness."

"Caches: The storage of boats or other equipment by the public is not permitted [in wilderness]. All equipment brought in must be taken out at the end of each wilderness trip."

"Chalets and Concessioner Camps: These facilities are not permissible [in wilderness]."

"Snowmobiles shall not be permitted except where designated by the Service when use is consistent with the park's natural, cultural, scenic and aesthetic values; safety considerations; park management objectives; and will not disturb the wildlife or damage other park resources. Where permitted, snowmobiles shall be confined to properly designated routes and water surfaces which are used by motorized vehicles or motorboats during other seasons." As further required by *NPS Management Policies*, Yellowstone National Park has published snowmobile regulations. These regulations (36 CFR Chapter 1, § 7.13) limit snowmobile travel to unplowed roadways on designated routes.

YELLOWSTONE NATIONAL PARK MASTER PLAN (1974)

"Yellowstone will be managed on a year-round basis. There are two defined periods of heavy use, and the management and operation must be geared to such for maximum enjoyment of the resources by the visitor - May 1 through October 31 and December 1 through March 15."

"To maintain the quality of a "winter wilderness," park roads will not be snow-plowed in winter except for the Gardiner Northeast Entrance Road. Oversnow vehicles will be restricted to unplowed roadways. Limited eating facilities and overnight shelter will be provided in the interior of the park as winter use may demand."

YELLOWSTONE NATIONAL PARK STATEMENT FOR MANAGEMENT (1986)

Management Objectives:

Perpetuate the natural ecosystems within the park in as near natural conditions as possible for their inspirational, educational, cultural, and scientific values for this and future generations.

Permit natural processes to function within the park ecosystem with minimum disturbance by man's activities.

Predicate public use, protection, development, interpretation, and management of the natural and cultural resources of Yellowstone National Park on documented data obtained through appropriate investigation and research.

Maintain close and harmonious relations with neighboring communities, counties, and States and work closely with other Federal Agencies, private groups, organizations, and individuals to provide a full understanding of park operations and purpose.

Survey the entire Yellowstone backcountry trail system and relocate, rebuild, or upgrade as necessary to meet current requirements.

Conserve nonrenewable fossil fuels and seek ways to utilize alternate energy sources in park operations.

Provide for the highest quality of use and enjoyment for each visitor to Yellowstone National Park and encourage all interests and ages to make full and appropriate use of park resources.

Provide maximum opportunity for park visitors to move freely and safely throughout the park using a variety of transportation methods that cause minimum interference with the natural environment. Consideration should be given to developing a system of walking paths or public conveyances to principal park features not accessible by automobiles, which would be handicap accessible.

Assure cooperation with Federal, State, and local agencies and private enterprise in efforts to provide an appropriate range of overnight and other visitor accommodations and related services outside the park through coordinated planning.

Minimize visual intrusion of human development on park resources.

Make the public aware of unusual environmental conditions and hazards and provide reasonable visitor protection.

Provide a variety of interpretive media and activities to increase visitor safety and understanding and to support appreciation for conservation of the park's natural, historical, and cultural resources. Interpret each unique park feature according to its dominant theme, such as history at Fort Yellowstone and geothermal systems at Old Faithful.

DEVELOPMENT CONCEPT PLANS FOR YELLOWSTONE

Development Concept Plans (DCPs) exist for Old Faithful, Fishing Bridge, and Grant Village. DCPs for Lake Village and Bridge Bay are in process. The only DCP that directly addresses winter use in Yellowstone is the Old Faithful DCP and Finding of No Significant Impact, approved January 1985:

"**Decision:** Improve winter visitor use facilities.

"**Rationale:** Winter use facilities will be pulled together and remain at approximately the same scale as present.

"**Mitigation:** Renovate Snowlodge to better serve winter visitors. A newly winterized dormitory near Snowlodge will provide winter lodging to replace lodging in existing cabins. Employee housing will occur across the highway to reduce impacts on the fragile resources and reduce conflict between employee housing and visitor use."

RESOURCE MANAGEMENT PLANS IN YELLOWSTONE

The existing *Natural Resource Management Plan* and *Annual Bear Management Plan* have been incorporated into this document. *The Backcountry Management Plan* in process and any future plans for specific management responsibilities, such as emergency medical services or visitor protection plans, should recognize winter use needs.

page 6 is blank

CHAPTER 3 DESCRIPTION OF THE ENVIRONMENT

GENERAL

Yellowstone became the world's first national park in 1872. Since its establishment, the idea of preserving natural environments in public trust has spread to most of the nations of the world. Yellowstone is recognized internationally as a World Heritage Site and Biosphere Reserve for its biological, geological and cultural significance. Almost all of the park's 2.2 million acres have been recommended for wilderness.

Yellowstone is largely a forested volcanic plateau with an average elevation of about 8,000 feet. The plateau is surrounded by higher mountains except on the southwest, where the Snake River High Plains lie about 1,000 feet lower. The plateau is studded with mountains reaching 11,000 feet and is cut by river canyons and valleys to as low as 5,300 feet. The Continental Divide traverses diagonally across the southwest corner of the park. This area is drained by the Snake, Yellowstone, Madison and Gallatin Rivers.

REGIONAL SETTING

Yellowstone is located in the northwest corner of Wyoming, with small sections extending into south-central Montana and east-central Idaho (Figure 1). Surrounded by Federal land, including Grand Teton National Park to the south, Yellowstone is the strategic core of a vast upland wilderness. This wilderness, encompassing Yellowstone and the adjacent wildlands, is called the Greater Yellowstone area and comprises what is the largest and most nearly intact ecosystem in the contiguous United States.

Today the park's popular winter program is an integral part of the regional tourism industry. Winter attractions to the Greater Yellowstone area include hunting, cross-country and downhill skiing, snowmobiling, sightseeing and wildlife photography. Visitors to the region often spend at least one day in the park. Many other visitors make Yellowstone their primary destination. The winter season is important to the economies of the park's gateway communities of West Yellowstone, Gardiner and Cooke City, Montana; and Flagg Ranch, Cody and Pahaska Teepee, Wyoming. These communities receive significant income by providing services to Yellowstone's visitors: guided tours, cross-country ski and snowmobile rental, food, gas and lodging. Major airports servicing this area are located in Jackson, Wyoming, and Bozeman, Montana.

Winter visitors generally enter Yellowstone by car, bus, snowmobile or snowcoach (Figure 2). The northern part of the park is accessible by car and bus. Vehicles entering the park through Gardiner can drive as far as Cooke City on plowed road, a total of 57 miles. The other entrances accommodate oversnow travel only. West Yellowstone advertises itself as the snowmobile capital of the world and furnishes almost half of the snowmobiles coming into the park. Smaller amounts of snowmobile traffic enter from Flagg Ranch, Gardiner and Pahaska Teepee/Cody. Relative visitor traffic through the five park entrances is shown in Figure 3.

As in summer, the most popular attractions within the park are Yellowstone's abundant wildlife, Old Faithful Geyser and the waterfalls at the Grand Canyon of the Yellowstone.

NATURAL RESOURCES

Thermal Areas

Yellowstone contains three-fifths of the world's geysers and countless examples of other geothermal features such as hot springs, travertine terraces, mudpots and fumaroles. The thermal areas take on an eerie look in winter as they are shrouded in steam and tree limbs are coated with rime. A unique ice formation called "pencil frost" occurs where thermal activity creates the right conditions of temperature and moisture.

Thermal areas have a particularly unique relationship to Yellowstone's flora and fauna in winter. Hot water

creates a microclimate that allows certain plants and insects to remain active and growing, even when air temperatures a few inches away hover well below zero degrees Fahrenheit. Warm ground keeps areas relatively free of snow, enabling herds of elk and bison to survive in the otherwise snowbound interior of the park. Hot springs flowing into lakes and rivers keep stretches of water open, enabling large numbers of ducks, Canada geese, and trumpeter swans to spend the entire winter in the park.

Flora

The flora of Yellowstone is typical of the central Rocky Mountains. Over 1,000 species of plants exist in communities ranging from alpine tundra in the mountains to sagebrush steppe near the park's North Entrance. Most of the Yellowstone Plateau is covered with lodgepole pine forests (*Pinus contorta*). Ross' bentgrass (*Agrostis rossiae*) is the only plant identified as endemic to Yellowstone. It occurs in thermal areas along the Firehole River. This plant would be considered for federal listing as an endangered species if it were not covered by a Memorandum of Understanding with the U.S. Fish and Wildlife Service.

Fauna

Only a few of the park's 230 bird species are winter residents. The most commonly seen winter birds include ravens, Clark's nutcrackers, mountain chickadees, magpies and waterfowl. Two federally endangered bird species, the bald eagle and the peregrine falcon, are present in Yellowstone during the seasons covered by this plan. A third, the whooping crane, could be present in the spring or fall. In addition, the trumpeter swan and osprey are also under special management in Yellowstone.

Over 60 species of mammals reside in Yellowstone throughout the year. Among the park's greatest attractions are the large herbivores, including bison, elk, moose, bighorn sheep, mule deer and pronghorn antelope. Winter conditions cause many of these ungulates to concentrate in areas with less snow. Both black and grizzly bears are found in the park. The federally threatened grizzly bear emerges from its den during the late winter season. Yellowstone is classified as habitat for the federally endangered gray wolf, although no packs are active in the park at this time. Other predators present in the park include the rarely seen mountain lion and wolverine, and the commonly seen coyote.

CLIMATE AND WEATHER

Winter conditions in Yellowstone last from November 1 to May 1, on the average (at Mammoth average first fall freeze is September 7, and average last spring freeze is June 8). Snowfall, which ranges from 80 inches at Mammoth to an estimated 200 to 400 inches along the Continental Divide and in the Absaroka Range, accounts for most of the park's annual precipitation (from 11 inches at Gardiner to 70 inches on the Continental Divide). Temperatures in January, the coldest month, range from nighttime lows near 0 F to daytime highs in the mid-twenties. Although the lower elevations of Mammoth and Tower are generally warmer than the interior, arctic air can invade the valleys, causing week-long spells of nights of -25 F and daytime highs of -10 F. Record lows are -66 F near West Yellowstone and -36 F at Mammoth.

HISTORY OF WINTER USE

In the last two centuries, winter use in Yellowstone has gone from a small Indian band to over 100,000 visitors today (Appendix 1). The Sheepeater Indians are the first humans documented to be year-round residents in the area. After the park was established, there were ten winter keepers in the park. However, the first consistent winter presence was that of U.S. army patrols, traveling on "Norwegian snowshoes" (skis) between cabins constructed specifically for winter patrols. Later, as buildings were constructed for accommodation of summer visitors, "winter keepers" were stationed in each developed area to take care of the buildings, mainly clearing snow from the roofs so that they would not collapse.

Winter automobile travel began in the 1930s on the plowed road from Gardiner to the Lamar Valley in the northern part of the park. On one day in January, 1939, 649 people entered by automobile through the

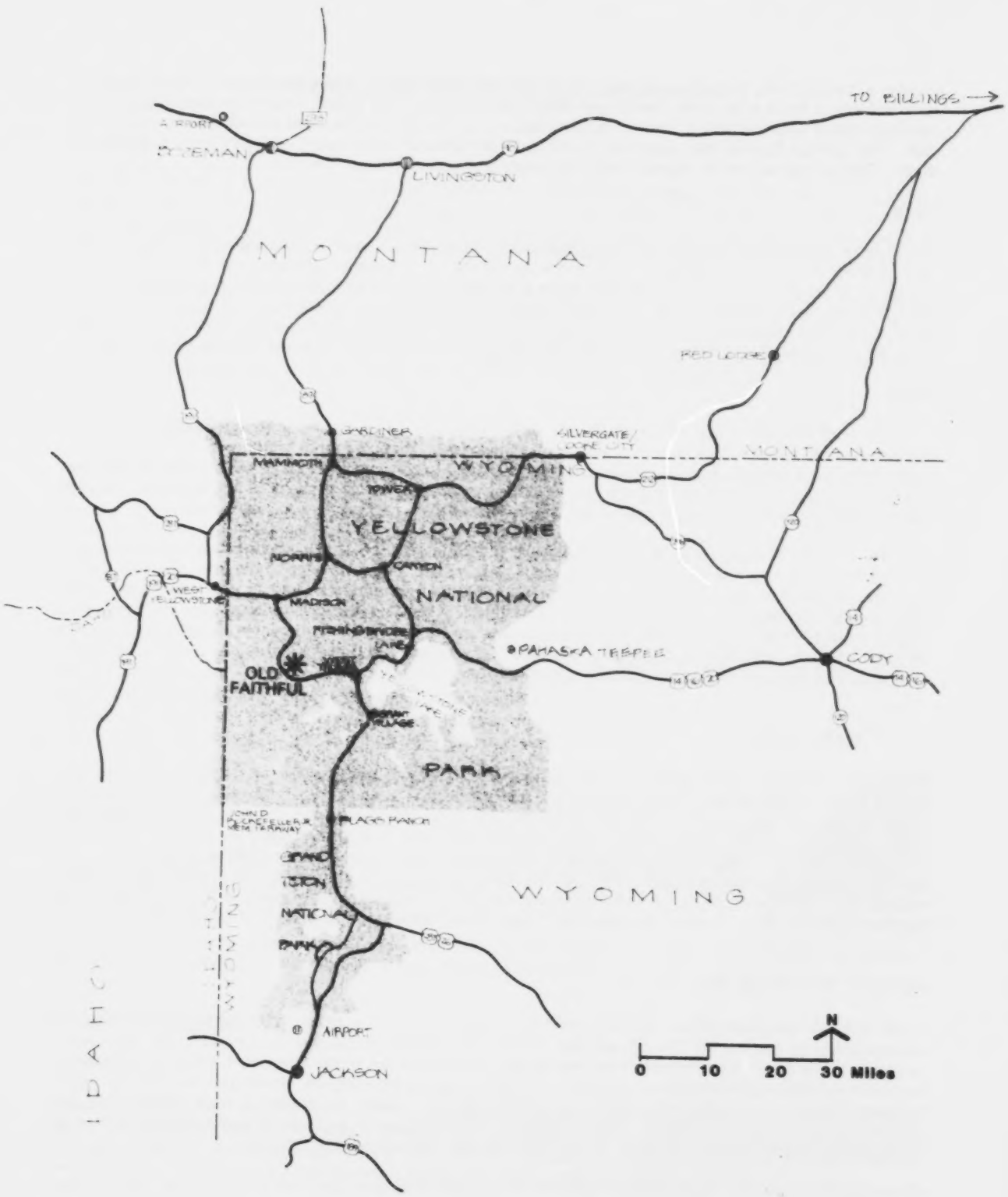


Figure 1. Regional map showing Yellowstone National Park and the surrounding communities.

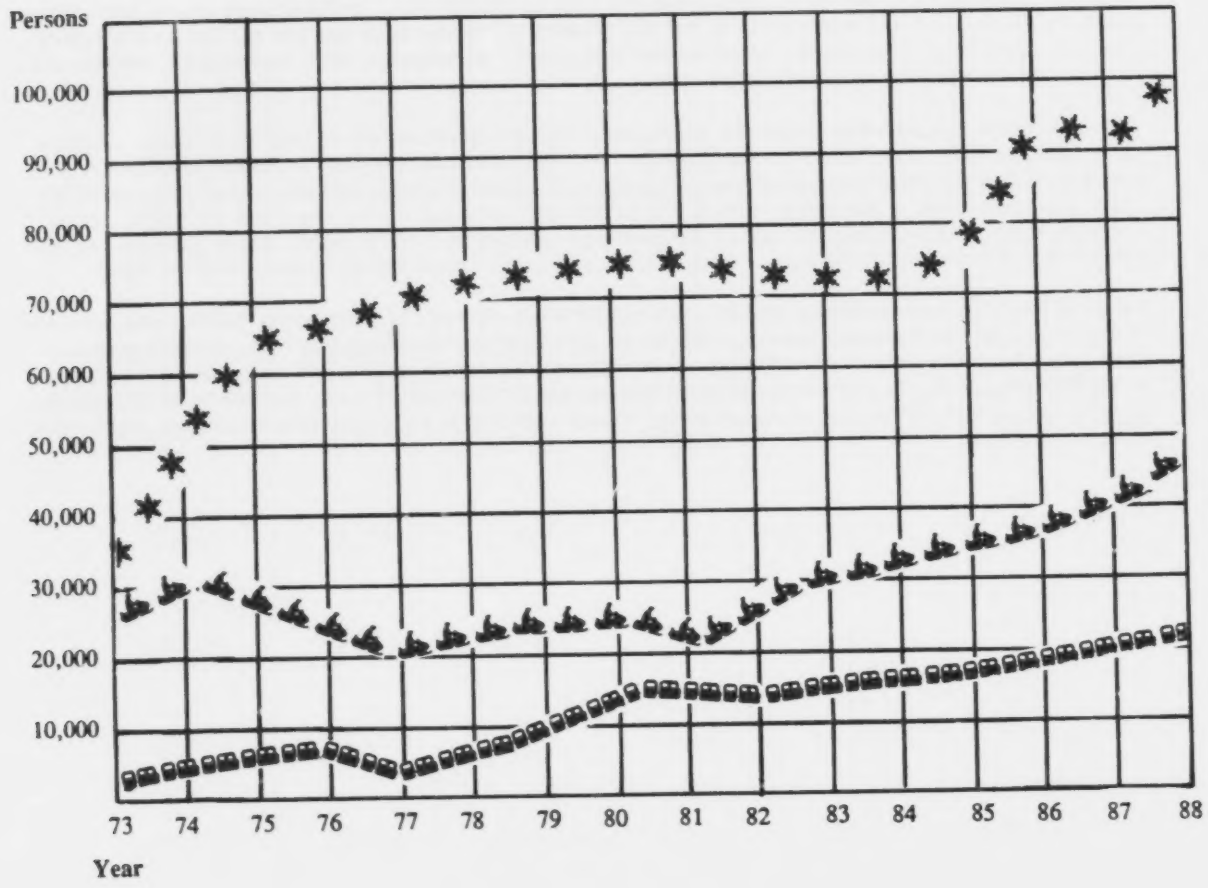


Figure 2. Winter visitation for Yellowstone National Park, December 1 - March 31, 1973-1988.

North Entrance to view wildlife and ski along the road to Cooke City. In 1949 snow plane tours were conducted from West Yellowstone to Old Faithful, allowing 35 people in 19 tours to see the park's interior. The first permit to operate charter snowcoaches in the park was issued in 1955, enabling 507 passengers to visit Yellowstone's winter wonders that year.

Winter visitation opportunities expanded significantly with the development of the snowmobile. In 1964, six private snowmobiles entered the park. Since that time, snowmobile travel has steadily increased, with a total of 45,025 people entering on snowmobiles during the 1986-87 winter season. Snowcoach passenger travel has also steadily increased, with 9,573 passengers entering during the 1986-87 winter season. Although cross-country skiing has become increasingly popular as a winter sport, no records are kept on the number of skiers using the park. Cross-country skiing has noticeably increased since the 1970s.

As winter visitation has increased, so have services for those visitors. Existing winter facilities are detailed in Figure 4. The Old Faithful Snowlodge opened in 1971, and the Mammoth Hot Springs Hotel opened in 1982 for winter overnight accommodations. Overnight use has increased from 648 people in 1971 to 34,347 in 1986-87 (Figure 5). Overall winter visitation has increased from virtually none in 1948 to 22,785 people in 1971 to over 100,000 visitors in recent years. Winter visitation is increasing proportionately faster than summer visitation.

Year	North	West	South	East	Northeast
1979/80	59,931	31,068	9,040	2,305	0
1980/81	40,899	32,196	11,220	1,503	2,071
1981/82	57,589	31,068	8,514	2,402	2,748
1982/83	23,226	32,569	10,795	2,017	2,956
1983/84	23,862	34,594	9,690	1,507	732
1984/85	26,167	36,097	9,535	2,706	3,174
1985/86	39,205	37,261	10,901	2,548	4,056
1986/87	26,144	43,338	12,951	3,737	4,611
1987/88	27,138	48,841	16,254	3,273	4,599

Figure 3. Winter visitor traffic by entrance gate for Yellowstone National Park, December 1 - March 31, 1979/80 - 1987/88.

CHAPTER 4 EXISTING MANAGEMENT GOALS

Management of winter use in Yellowstone shall perpetuate and protect the natural processes, unique flora and fauna, and geological systems found within the park. It shall also preserve the opportunity for public enjoyment of the unique winter environment and solitude of Yellowstone. This section articulates goals that currently direct management strategies for winter use. The existing park policies which guide managers in reaching management goals are outlined in Chapter 5 of this plan.

RESOURCE PROTECTION

Natural Resources

The winter environment requires more sensitivity for the protection of some natural resources than does the summer environment. In particular, the vulnerability of wintering wildlife and the fragility of life in thermal areas is recognized. Biologically and geologically sensitive areas will be identified and monitored to protect the resources, keeping environmental impacts at or below those presently occurring. No impacts will be allowed on threatened and endangered species as a result of winter use. All areas recommended for wilderness status will be managed so as not to preclude eventual designation. No future development will be permitted for winter use until adequate research has been completed to determine levels of use that could be sustained without adverse environmental impacts.

Cultural Resources

Winter's blanket of snow and cold weather give added protection to many of Yellowstone's archaeological and historic resources. Historic structures, however, lie dormant and are potentially vulnerable to uncontrolled fires and deterioration from heavy snow and moisture. Sensitive cultural resources will be identified and monitored for protection.

Visitor Experience

The winter program recognizes the importance of Yellowstone as "an island of wilderness serenity." The quality of a winter visitor's experience is closely linked to encountering the park under relatively uncrowded conditions. Additionally, visual impacts and undesirable noise can detract from a positive park experience. In order to maintain a quality winter experience for visitors, efforts will be made to prevent overcrowding and degradation of aesthetic resources.

VISITOR USES

The winter program should offer visitors the opportunity to meet nature on its own terms, preserving the sense of solitude and challenge that early winter visitors to Yellowstone experienced. To meet this objective, the emphasis will be on experiencing the natural wonders of the park. Visitors will be able to choose from a range of experiences in terms of the degree of solitude or contact with other visitors, the amount of physical effort and self-reliance, and the amenity level of accommodations. New recreational opportunities may be permitted if they draw their meaning from association with, and direct relation to, park resources, and if they are consistent with the protection of the resources.

ACCESS

A spectrum of visitor experiences will be provided, ranging from easy motorized travel through challenging wilderness adventure. Providing such a spectrum requires regulating the types and levels of use in specific areas of the park.

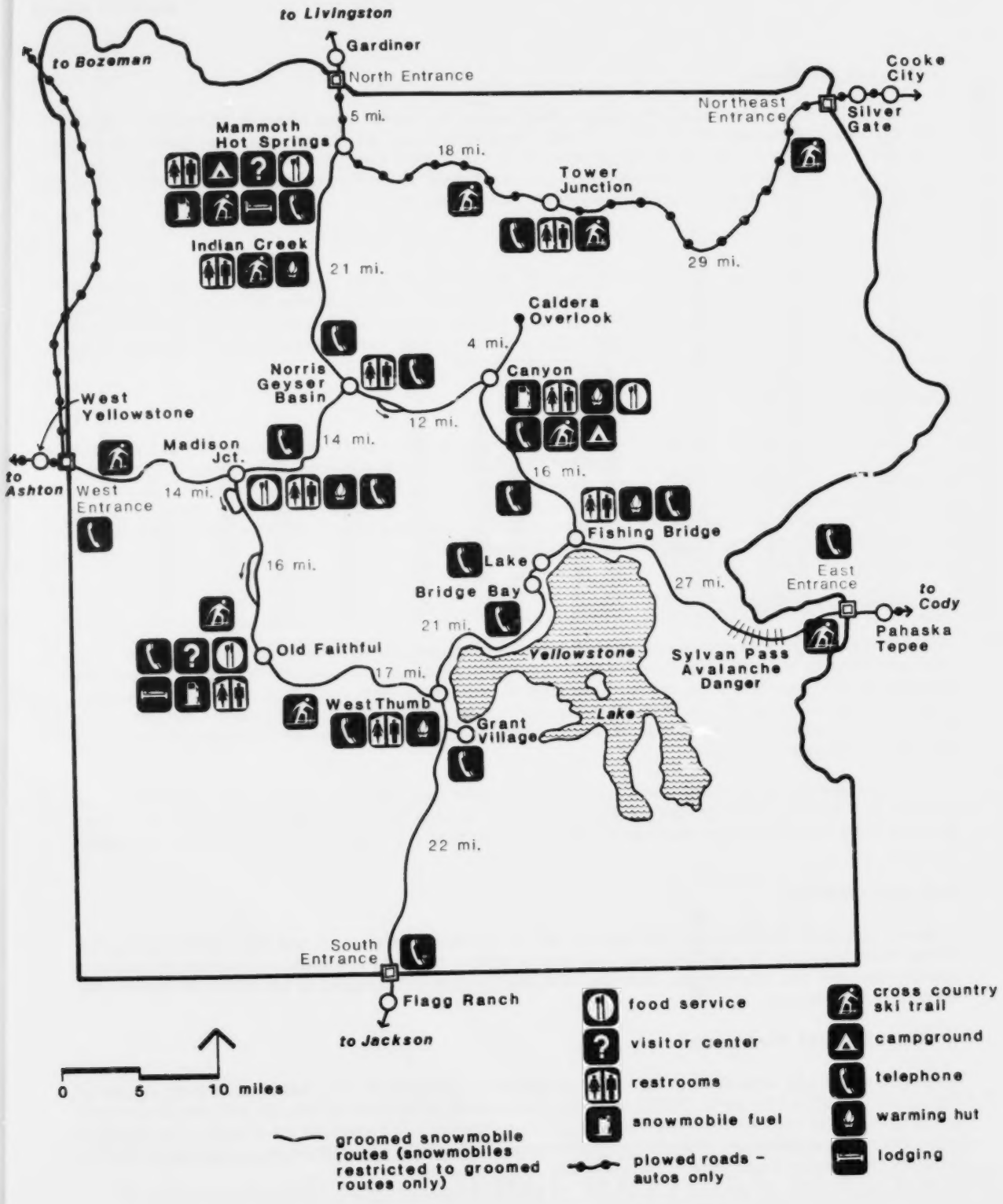


Figure 4. Existing winter facilities and services in Yellowstone National Park.

Roads and Snowroads

Yellowstone's Master Plan seeks to preserve the "quality of a winter wilderness" in Yellowstone by not plowing most of the roads during winter. Instead these same roads are open to oversnow travel and offer a special opportunity to experience Yellowstone. E.O. 11644, NPS Management Policies and Yellowstone special regulations confine snowmobile use to unplowed roads on designated routes. Reasonable efforts will be made to keep plowed and unplowed roads safe for visitors.

Trails

Nonmotorized travel is permitted both on and off trails throughout the park except in areas closed or restricted for resource protection and visitor safety. Guidelines will be established for maintenance and signing of designated trails for nonmotorized travel. Trails can be modified to provide a safer or more enjoyable visitor experience if resource impacts are avoided. New winter trails may be established under strict guidelines providing for maximum resource protection.

Handicapped Access

The issue of handicapped access in winter, as in summer, centers around the problem of access for the mobility impaired, with the additional problem that facilities which are accessible in summer become inaccessible in winter, due to the presence of snow and ice on roads and walkways. National Park Service policy on handicapped access calls for the provision of access where developed facilities are provided for nonimpaired visitors. Recognizing the problems posed by oversnow access, all reasonable efforts will be made to improve the winter experience for handicapped visitors.

FACILITIES AND SERVICES

The purpose of any National Park is to provide visitors the opportunity to experience the park's resources, while providing for the protection of those resources. Visitor facilities and services help make Yellowstone available for the enjoyment of the public. Their location and impact on the park shall be carefully regulated and monitored so as to ensure resource protection. If adequate facilities exist outside the park, such facilities will not be developed or expanded within. Visitor facilities and services will emphasize experiencing the natural wonders of the park.

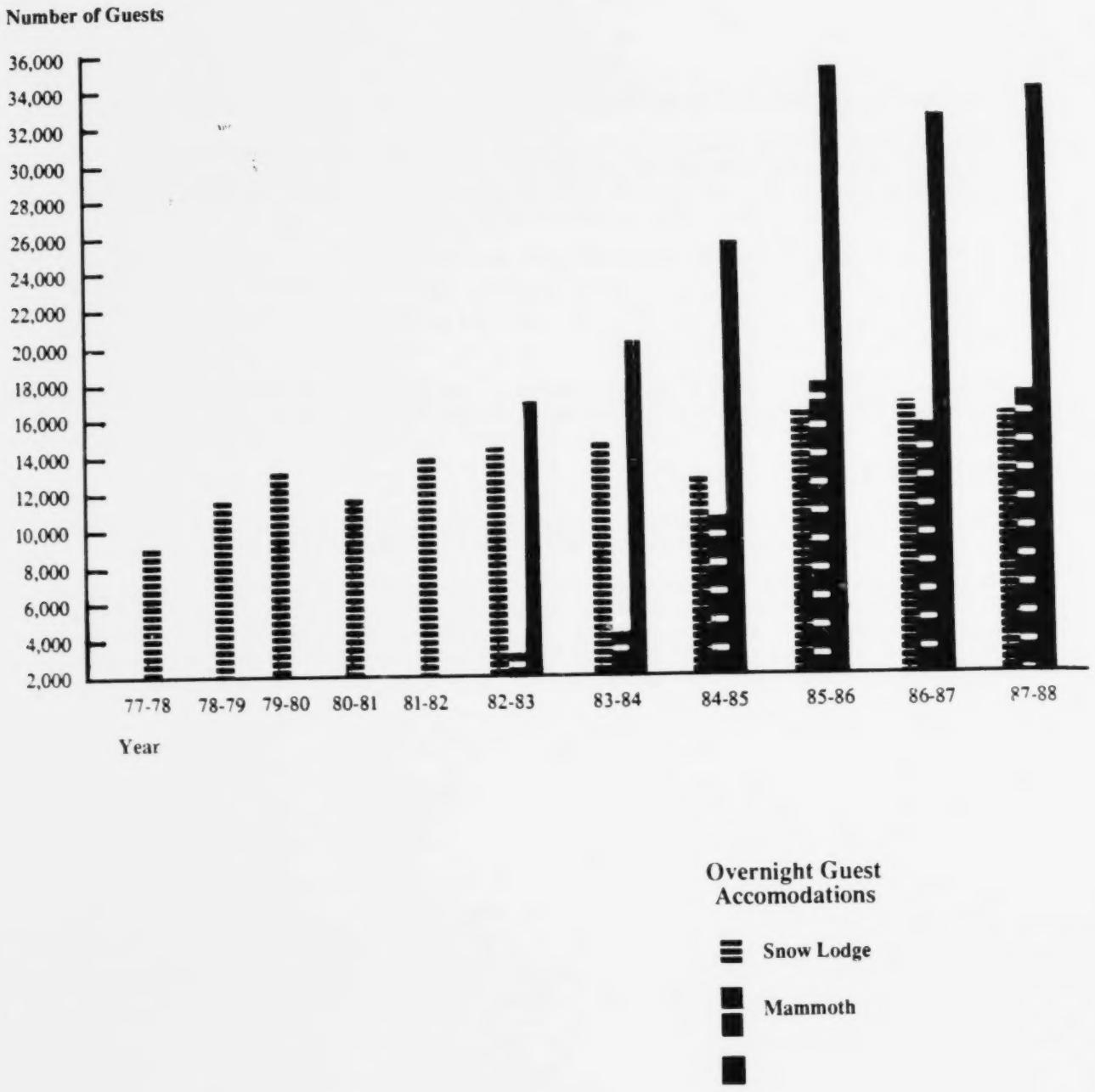
Concession operations in Yellowstone are managed under concession contracts and commercial use licenses and permits with the National Park Service to provide food, overnight lodging, transportation services, equipment rentals, general merchandising and gasoline at a range of prices comparable to outside services.

Overnight Facilities

A variety of quality overnight accommodations will be provided at Mammoth and Old Faithful during the winter, from low cost to standard rates, to enable visitors to enjoy the park. A variety of camping opportunities will also be available, from the vehicle-accessible campground at Mammoth to challenging wilderness experiences.

Guiding and Fixed Base Camps

Guiding in winter (ski, snowshoe, snowmobile, photographic, educational, etc.) will be permitted, subject to regulation, throughout the park. Guides can serve the purpose of interpreting the park and teaching proper use of park resources and skills. Fixed basecamps are temporary, low impact camps or caches for repeated or continuous use during an extended period of time. This activity, allowed under a concession permit, provides an alternate experience to current winter accommodations.



5. Visitor use of winter overnight accomodations for Yellowstone National Park, 1977/78 - 1987/88.

INTERPRETATION AND VISITOR INFORMATION

Each visitor should have the opportunity to interact physically and emotionally with the environment. Winter in Yellowstone is a time of harsh weather, unknown dangers and a fragile balance in natural systems. It is vitally important to both public safety and the protection of natural systems to enhance visitor understanding and appreciation of this special Yellowstone season.

Winter visitors will be provided with the information they need to have a safe and enjoyable park experience. A variety of opportunities will be made available to visitors to safely interact with and enjoy the potentially dangerous, the fragile, the irreplaceable resources of the park while protecting those resources from overuse, unintentional damage, vandalism and theft. Every effort will be made to make this information available before, at the outset of, and during their visit.

Winter visitors will have a variety of services, activities and opportunities to aid them in gaining a deeper appreciation and understanding of park resources, and by extension, their heritage.

VISITOR PROTECTION AND SAFETY

Visitor protection and safety are critically important issues during the winter. Cold weather, snow and winter storms can create hazardous circumstances, making winter travel difficult and sometimes dangerous.

The goal of visitor protection is to provide personnel and equipment sufficient to give the visitor a reasonable degree of safety, personal protection, medical assistance, and search and rescue response. Visitor safety concerns will be remedied as they are identified. Safety guidelines will be developed for motorized and nonmotorized travel corridors. Visitor protection and safety will be considered in making any changes to access or facilities. Areas may be closed if adequate protection and safety cannot be provided.

page 17 is blank

CHAPTER 5 EXISTING MANAGEMENT POLICIES

This section describes the existing policies guiding managers in efforts to achieve the management goals outlined in Chapter 4. Problem areas have also been identified where more information is needed before policies can be established. All nonemergency regulations of visitor use will be approved by the Superintendent and listed in the *Code of Federal Regulations* or the *Compendium of Superintendent's Regulations Under 36 CFR 1.5.*

RESOURCE PROTECTION

Resource protection efforts have concentrated on identifying critical and sensitive resource areas for monitoring and protection. A map of critical winter wildlife habitat appears in Figure 6. A list of sensitive winter resource areas, along with their current management policies, appears in Appendix 4. The identification and monitoring of sensitive areas is expected to keep environmental impacts at or below those presently occurring. Proposed additional research is expected to reduce impacts over the long term.

The following existing Federal regulations assist in the protection of resources:

-Snowmobiling is restricted to designated unplowed roadways;
-Travel in thermal areas with developed trail systems is restricted to boardwalks and trails;
-No off-trail travel is permitted in the Grand Canyon of the Yellowstone;
-No bathing is allowed in waters originating entirely from a thermal spring or pool;
-Use of the Boiling River Hot Springs area of the Gardiner River is restricted to daylight hours;
-The thermal area known as Potts Basin, adjacent to the West Thumb Geyser Basin, is closed to public entry (for safety reasons);
-Human use in the McMinn Bench area is regulated to protect bighorn sheep;
-Entering caves, pits and holes is prohibited;
-Visitors may be cited for harassing wildlife and for destroying or removing natural or cultural resources;
-Critical wildlife habitat areas may be closed to visitor use.

Overnight and unregulated day use can contribute to resource impacts and crowding. Visitor attitude and impacts on resources will be monitored to assist managers in establishing policies to regulate visitor use. Limits may be placed on visitor numbers, travel routes, stay length, party size, campsite location, use of caches, and other restrictions necessary to provide resource protection and visitor satisfaction. Although visitor recreational opportunities could be reduced by management measures, environmental education opportunities would be created.

If resource damage is occurring, a graduated system of protection measures will be implemented in problem areas using the discretionary authority of the Superintendent under 36 CFR 1.5. Measures applied will depend on the severity of the problem, and less restrictive measures will be tried first. Measures will include (but will not be limited to) the following:

-Increasing efforts to educate the public;
-Marking and packing trails to channel visitors from affected areas;
-Directing visitor use away from affected areas by omitting

areas from maps, guides and other information provided to visitors;
-Directing use away from affected areas by closing or not plowing parking areas and covering or removing signs;
-Limiting frequency of trips into affected areas, for example to a specified number of parties per month;
-Closing affected areas for the minimum time period necessary to avoid impacts;
-Restricting use in specified areas.

Exhibits at warming huts and visitor centers and personal contacts by rangers will assist in protecting resources by directing visitors away from areas where impacts could occur and by telling visitors how to avoid conflicts with wildlife.

Natural Resources

Research concerning the impacts of winter use on resources, particularly wildlife, will be given high priority both in the park's research program and in the selection of independent research projects. Research will be conducted to provide baseline data and measure impacts. A system of observation by qualified park personnel will be developed and implemented to assist in collecting data. A list of specific research needs is contained in Appendix 3. Yellowstone's *Natural Resource Management Plan* will be followed in winter as in summer.

Geothermal Areas. No impacts will be allowed to occur in geothermal areas as a result of winter use. Walking off trail damages vegetation and fragile mineral resources. Travel will be restricted to paths and boardwalks developed for summer use. Off trail travel will only permitted under ranger lead interpretual activities.

Flora. There is some risk of impact to flora due to cross-country skiing, sledding, hot-potting, illegal off-road snowmobiling and illegal off-trail hiking in thermal areas. Where snowcover is thin, skis, sled runners and foot traffic can damage plants. Sensitive areas will be monitored for protection. Thermal areas containing Yellowstone's only endemic plant, Ross' bentgrass *(Agrostis rossiae)*, will be monitored in winter as in summer.

Subnivean Environment. Snow compaction has been shown to alter snow density, hardness, thermal conductivity and rate of runoff during melting. As a result, flora and fauna can be affected by changes in temperature regimes and mechanical effects of compacted snow. Effects on the distribution of small mammals, and growth and species distribution of plants have been documented. Research is needed to determine what resources are being affected, to what extent, and how such impacts can be avoided.

Birds. Wintering populations of two species of birds are particularly susceptible to human use during the time period covered by this plan: bald eagles and trumpeter swans. The bald eagle is federally listed as an endangered species. Yellowstone supports a small wintering population of these rare birds. Wintering and migrating populations of trumpeters occur in Yellowstone. These birds can also be displaced from preferred habitat. Under the *Natural Resource Management Plan*, areas may be closed temporarily at any time to protect these bird species. Wintering birds will be monitored to ensure that winter use does not affect populations.

Large Mammals. The most obvious and extensive impact of winter use is on the ungulates (hoofed animals), which are in an energy-deficit condition during winter. Elk, deer and bison flee from approaching skiers. The packed snowroads provide unnatural travel routes that have altered species distribution. When approached by snowmobiles, they will run ahead of the machines for miles, rather than move off into the deep snow. Many visitors are unaware or unconcerned about the energy costs to animals caused to flee. Some visitors harass and even run down animals on the groomed snowmobile roads. Further study is needed to determine whether energy expenditures caused by these impacts are affecting individual mortality

or population dynamics.
Poaching of animals and illegal collection of antlers are major problems in winter. Park rangers must devote time to road and backcountry patrols to prevent these resource losses.

Bighorn Sheep. Portions of bighorn sheep winter range are closed or restricted to reduce stress on the population by visitors seeking photographic opportunities. On-going monitoring will continue, and if current restrictions are not sufficiently protecting the population, more stringent restrictions will be applied.

Bears. Yellowstone is the home of two bear species: grizzly and black. The grizzly is federally listed as a threatened species. The potential for human impact on bears is greatest during the spring and fall, although bears have been seen in the park during every season. During the late winter and spring, bears emerge from their dens (late February through mid-April). Bear-human conflicts can arise while bears are feeding on carrion (ungulate winter range and winter use areas largely coincide). In the fall, bears are more active than normal as they seek high-quality food sources in their final efforts to accumulate the energy reserves necessary to last through their winter sleep. There is no evidence that winter use in Yellowstone has ever caused a bear to leave its den.

The annual *Bear Management Plan* will be followed in winter as in summer. This plan specifies closures and restrictions to protect the threatened grizzly bear, including temporary closures of areas where bear activity is observed. Strict control of food storage and garbage is enforced during all seasons in the park.

The Yellowstone black bear has received relatively little scientific attention compared to the grizzly. Although procedures for handling problem black bears differ slightly from those used with the grizzly, black bears are equally protected by the bear management program.

Wolf and Mountain Lion. In the early part of this century, predator control programs eliminated the gray wolf from Yellowstone and reduced mountain lion populations. Today the wolf is listed as an endangered species in the park, although no wolf packs are active in this area. Management guidelines addressing reintroduction of the wolf to Yellowstone will need to consider management policies for the winter.

Very little is known about the recovery level of Yellowstone's mountain lion population. Current research has identified 12-15 lions in the Northern Range of the park. Research will examine how lions are affected by visitors, as well as how they are affected by pressures from outside the park.

Cultural Resources

As sensitive cultural resources are identified, protection measures will be initiated. No activities will be permitted that would expose the Old Faithful Inn or other historic structures to fire risk.

Visitor Experience

In order to maintain high quality visitor experiences during the winter, levels of use will be monitored and visitor attitudes sampled to assist managers in establishing policies to avoid overcrowding, minimize visual impacts, and regulate undesirable noise levels. Visual resources may be protected by restrictions on visitor uses in an area. Each decision to close an area to protect visual resources will be based on the outstanding scenic value of the area, the amount of use the area receives, and the amount of reduced recreational opportunity. Existing regulation prohibits off-trail travel in the vicinity of the Grand Canyon of the Yellowstone to prevent interfering with visitor enjoyment of scenic views of the Upper and Lower Falls. New ski trails will avoid impacting visual resources.

VISITOR USES

In an effort to preserve the sense of solitude and challenge that early winter visitors experienced in Yellowstone, the following recreational activities are encouraged and supported: cross-country skiing, snowshoeing and sightseeing (includes photography and nature study). Bathing in geothermally heated

waters ("hot-potting") is permitted in water that does not originate entirely from thermal springs or pools.

Snowmobile and snowcoach use is supported as a necessary means of transportation for sightseeing, just as automobile and bus transportation are supported. Sledding, tobogganing and ice skating (on lakes and ponds) are not prohibited, but visitors have shown little interest in these activities.

The major winter concessioner provides a sleighride on designated roads in the Mammoth area and ice skating on an artificial ice rink at Mammoth.

Ice climbing is a relatively new activity that is occasionally practiced in Yellowstone. The only area closed to this activity is the Grand Canyon of the Yellowstone.

Fishing is prohibited in the park during the winter to avoid impacting wintering wildlife that concentrates along thermally fed rivers. Dogsledding and ATV use are also prohibited. Any additional recreational activities that might be permitted in Yellowstone must first be approved by the Superintendent. Approval may only be granted for activities that are safe, appropriate and have no resource impacts.

ACCESS

Off-road access will be restricted to nonmotorized travel except for administrative purposes approved by the Superintendent. Managers may regulate day use access as visitor attitude and impacts on resources warrant. Winter maintenance plans will be developed for each area, designating which roads, snowroads, paths, boardwalks and overlooks are to be maintained.

Roads and Snowroads

Wheeled vehicle and oversnow vehicle traffic will be separated. Current maintenance and signing standards for roads and snowroads appear in Appendices 5 and 6. All motor vehicle laws apply to oversnow vehicles. Off-road snowmobiling is only permitted for administrative purposes approved by the Superintendent. Under specific guidelines, snowcoach travel is permitted between Mamouth Teraces, Mamouth Motel, and the Gardner Maintenance facility.

Trails

In order to lure visitors into a more interactive experience with the park, safe access will be provided to selected scenic attractions and natural areas, removing some of the difficulty of winter foot travel. This will be accomplished by clearing or packing paths and boardwalks for safe walking and by packing and tracking ski trails. Machines for tracking or clearing trails must be used according to Yellowstone policy (Appendices 7 and 8). Conflict between foot and ski traffic on maintained trails will be reduced by providing each with a separate trail or designating trails for one type of traffic only. In each area where maintained trails are provided, a plan will be developed stating which trails, paths, boardwalks and overlooks will be maintained. Upon approval by the Superintendent, these plans will be amended to the *Winter Use Plan*.

Snow is cleared or packed on designated paths, boardwalks and overlooks for safety and ease of access by visitors on foot. In thermal areas especially, paths and boardwalks can be hazardous because of ice and snow accumulations. Path, boardwalk and overlook maintenance standards are contained in Appendix 7.

The National Park Service believes visitors will have a better park experience if they go beyond developed areas. Because the majority of visitors use cross-country skis for foot travel, Yellowstone supports cross-country skiing by providing ski trails. Many visitors with no prior skiing experience find that they can quickly master the skill well enough to get out on easier trails to enjoy Yellowstone in winter. Packed and tracked ski trails make skiing easier and more enjoyable for beginning skiers and function to channel visitors into areas where dispersed travel would impact wildlife.

Specially designated ski trails will be signed, mapped and maintained. Standards for the development, improvement and maintenance of these trails appear in Appendix 8. Designated ski trails will be rated consistently throughout the park, and trail lengths and difficulty ratings shown on maps and trailhead signs. Some improvements to backcountry trails may be made for safety. Where snowroads form part of a ski trail system or where level of skier use justifies, parallel ski trails may be developed.

Handicapped Access

Because much of the outdoor environment is snow covered, access for the mobility impaired is especially difficult. The park will endeavor to provide the highest degree possible of accessibility for the mobility impaired within technological and economic constraints. This will include development of innovative means of transportation, where feasible. Public transportation systems will be modified or alternative transportation will be provided where feasible for both road and oversnow transportation. Area winter maintenance plans will designate walkways that require special maintenance for handicapped access to facilities and services.

FACILITIES AND SERVICES

In accordance with 36 CFR 5.3, appropriate authorization is required for all commercial uses. A commercial use licensee may engage in only those activities specified in the license. Special conditions are attached to the license for each activity. Licenses may be suspended for violation of the conditions. Forms and information for commercial use licenses are contained in Appendix 11. Nonprofit educational uses will not require a license, but will be required to comply with the same conditions as commercial users.

Literature and personal contact will be used to educate commercial and nonprofit users in proper use and care of the park. In order to reduce the potential for overcrowding of popular areas, commercial/nonprofit users will be encouraged to notify the Superintendent in advance of all proposed trips. Where crowding occurs, groups will be encouraged to use different areas. If such conditions become frequent, prior notification may become mandatory.

Advertising and Promotion

The National Park Service recognizes that some advertising is necessary to make the public aware of available facilities. Because the purpose of a national park is to provide visitors with the opportunity to experience the park's resources, advertising will be carefully reviewed by the NPS to ensure that the park is being advertised not on the basis of concessioner-provided amenities, but rather on the basis of the park's natural attractions. Advertising will also be examined to ensure that recreational opportunities in the park are accurately portrayed. Advertising and promotion will be consistent with the NPS *Concession Management Guideline* (NPS 48).

Overnight Facilities

Accommodation prices will be comparable to those found outside the park. While camping can be a low-cost alternative to lodging in summer, winter camping is much more difficult and requires specialized equipment. For this reason, low-cost hostel or dorm accommodations will be encouraged at existing overnight facilities.

A variety of winter camping experiences will be offered in the park, from vehicle-accessible campgrounds to challenging wilderness experiences. In order to protect sensitive resources and maximize visitor safety, special regulations for winter backcountry use are required (see Appendix 10). As in summer, backcountry camping will be provided under the permit system. Regulation of party size and length of stay will be governed by year-round regulations, except where different winter use limits are approved by the Superintendent and published in *Yellowstone Backcountry Campsites* (YELL 475). Campers will not be required to stay at designated sites, except where specific winter sites are necessary for resource protection. Where specific sites are designated, they will be approved by the Superintendent and published in YELL 475 or a similar publication prepared for the winter season. All backcountry permits will be issued in person by

a ranger. The backcountry visitor will sign a checklist indicating that all necessary regulations and policies are understood. With the exception of Mammoth Campground, a backcountry permit is required for all camping in the park. Winter camping in summer developed campgrounds and picnic areas will be permitted only if toilets are provided.

There are no existing huts or fixed base camps in Yellowstone appropriate for hut-to-hut skiing. All of Yellowstone's backcountry proposed for wilderness designation must be managed as if it were designated (NPS, 1972). For this reason, the following National Park Service *Management Policies* prohibit the development of huts and fixed basecamps:

> "Structures or facilities in support of commercial services are not permitted in wilderness";
>
> "Caches: The storage of boats or other equipment by the public is not permitted [in wilderness]. All equipment brought in must be taken out at the end of each wilderness trip";
>
> "Chalets and Concessioner Camps: These facilities are not permissible [in wilderness]."

Guiding and Use of Fixed Base Camps

Guiding in winter (ski, snowshoe, snowmobile, photographic, educational, etc.) will be permitted, subject to regulation,throughout the park. Both commercial and nonprofit guiding may be regulated by a day-use permit where necessary to protect the park resources and avoid overcrowding. Overnight trips will be regulated through the backcountry permit system.

Fixed base camps will be permitted only at approved locations in developed areas (for a definition of developed area see the Management Zones section of this plan). They may not be located in areas where visitors could adversely impact park resources or cause crowding.

Other Facilities and Services

Policies governing additional facilities and services offered in the park must adhere to the goals outlined in previous sections of this plan. Although vault toilets along roads and in threshold areas are open, most cannot be serviced in the winter.

INTERPRETATION AND VISITOR INFORMATION

A concerted effort will be made to give visitors the information they need to have a safe and enjoyable experience in the park, while protecting the park resources. Fee collection rangers will hand out winter information that provides basic safety, resource protection and visitor service information. Weather and road/snowroad conditions will also be available at entrance stations. When a station is unstaffed, a supply of the winter information will be left in a box at the station window.

Visitor centers serve as focal points for visitor information in developed areas. Warming huts also serve as information centers during the winter. These facilities will be supported as important contact stations for the public. Visitor centers, warming huts and lodging registration desks will be contact points for emergency services. A variety of interpretive programs and displays will be made available to increase visitor understanding and enjoyment of Yellowstone. Interpretive brochures for major scenic areas will be available year-round.

Area winter maintenance plans will detail which interpretive exhibits will be maintained for winter use. In each area where interpretive exhibits are to be maintained, signs and exhibits will be modified as necessary

to ensure visibility and safe access. A series of new winter wayside exhibits (see *Yellowstone National Park Winter Wayside Exhibit Proposal,* 1985) has been developed and will be constructed as funds become available. These new exhibits will be included in area winter maintenance plans.

Ski maps will be provided for all maintained ski trails in threshold areas. These maps will be consistent in format throughout the park (see Appendix 9). Where trail signs, trail markers and trail map exhibits are provided, these will also be consistent in design throughout the park. District Rangers will ensure that signs, maps and map exhibits are accurate and consistent. Commercial guidebooks sold in the park will be reviewed annually for accuracy and authors will be encouraged to update them as necessary. Guidebooks with serious inaccuracies will be removed from sale pending revision.

Backcountry information and permits will be available at visitor centers or ranger stations. Because knowledge of winter travel conditions and area hazards can be critical, visitors will only be allowed to get permits from designated personnel within the area (see Visitor Protection and Safety section below).

Prospective visitors can obtain information in advance by phone or mail from park headquarters.

VISITOR PROTECTION AND SAFETY

Visitors will be informed of risks and precautions that should be taken while traveling on snowmobiles, while walking on maintained boardwalks and trails, while skiing or snowshoeing, and during overnight backcountry travel. As in summer, many visitors to Yellowstone are inexperienced and unaware of the dangers that are present in the natural environment. Dangers in winter include thin crusts and scalding water in thermal areas, icy roads and boardwalks, cliffs, avalanches, thin ice, wildlife encounters, hypothermia and frostbite. A list of potentially dangerous park areas is included in Appendix 4. Current safety regulations for these areas are also identified.

The permit system for backcountry use provides the opportunity to contact backcountry users, inform them of dangers, and initiate search and rescue efforts if parties are overdue. There is no equivalent system for contacting and monitoring day users.

Ranger stations and roadside telephones can be vital links for obtaining emergency services. Telephones will be clearly signed and shown on the winter map/brochure. The park roads, developed areas, threshold areas and backcountry will be patrolled at varying levels of frequency. Visitors will be advised never to travel alone, regardless of type of transportation. Ranger stations that are not staffed in winter will not be shown on maps or brochures.

Methods of transportation of injured persons will be investigated and best available methods within cost constraints will be selected and incorporated into emergency medical service plans. Use of snowmobiles in emergency backcountry search and rescue is permitted.

page 25 is blank

CHAPTER 6 MANAGEMENT ZONES

Several types of land use have been established during winter in Yellowstone. As winter use has increased, visitor demands for facilities and services have also increased. Some summer developed areas have been opened for visitor use. Other developed areas are strictly used for administrative purposes. Natural areas surrounding these developed areas have become increasingly popular for winter recreation. Yellowstone's extensive backcountry becomes particularly critical for winter wildlife populations operating on an energy deficit. The existing land use classification system for Yellowstone does not address these unique winter situations.

As an aid to current management of winter use, an existing winter land use classification system has been developed based on the year-round land use classification system (Figure 7). Three land use zones are used: Developed, Threshold and Backcountry. The Threshold Zone outlined in this section is referred to as the "Natural Zone" in Yellowstone's Master Plan. Guidelines for each category are described below in terms of resource protection, visitor use and access, facilities and services, interpretation and visitor information, and visitor protection and safety. Individual park areas within each category are then listed and described, and existing conditions are delineated.

These zones are interim assignments established to aid winter use management and are not intended for use during the shoulder seasons. The management zones will remain in effect until the Winter Use Plan is completed.

DEVELOPED AREA ZONE

The purpose of developed areas is to provide necessary visitor and employee services requiring permanent structures and motorized access to those services. Developed areas include visitor facilities, administrative facilities (entrance stations, administrative buildings, ranger stations, employee housing, maintenance shops, storage areas and utility structures), and roads and snowroads. Roads and snowroads, connecting areas with permanent structures, include only the constructed road surface and shoulder, or groomed snow surface and berm. All developed areas for winter use are within summer developed areas.

Resource Protection

Visitor use in geothermal areas will be restricted to boardwalks and trails developed for summer travel. Travel will be controlled to minimize displacement of wildlife, destruction of vegetation, and impact on other resources or as designated under ranger lead interpretive activities. Although some habituation of wildlife is expected, harassment and movement of wildlife, causing significant caloric expenditure, will be minimized by ranger patrols and printed and verbal information. Open fires will be permitted in campgrounds where fire grates are available and accessible, but gathering of firewood will be prohibited.

Visitor Uses and Access

Motorized travel will be permitted on designated routes. Wheeled vehicle and oversnow vehicle traffic will be separated. Trails will be maintained for ski and/or foot access to all open facilities and trailheads. Skiing will be permitted on snowroads, but not plowed roads. Parallel trails may be developed for ski travel where roads or snowroads are part of a ski trail system or where justified by level of skier use. Machines may be used to maintain paths, boardwalks, overlooks and ski trails according to guidelines in Appendices 7 and 8. Handicapped access will be provided where feasible. An area winter maintenance plan will be prepared designating all travel routes to be maintained.

Facilities and Services

Approved services will be provided as specified for each developed area, including gas, food service, lodging, camping, camper services, stores, equipment rental, ski instruction and guide services. With the

MAPS

TRANSPOSED TO

END OF VOLUME

exception of the Mammoth Campground, all camping will be under the backcountry permit system, regardless of location. At a minimum, vault toilets are required in any developed area designated as a winter campground. Seasonal fixed base camps may be placed at approved locations in developed areas. Emergency road service will be available on all roads and snowroads from concessioners or other private sources.

Interpretation and Visitor Information

A concerted effort will be made to provide visitors with the information they need for a safe and enjoyable experience. Staffed visitor centers, museums, warming huts, guided walks, ski tours and evening programs will be provided where visitor use warrants. Information on trails designated for walking, skiing and snowshoeing will be provided.

Visitor Protection and Safety

Fire protection, emergency medical services and law enforcement will be provided in accordance with year-round plans. Safety will be enhanced by clearing or packing paths and boardwalks, packing trails for ski and foot travel, careful design of circulation patterns, printed and verbal information, and signing.

Wheeled vehicle, oversnow vehicle and pedestrian traffic will be separated. Where roads form part of a ski trail system, parallel trails will be provided to separate ski and motorized vehicle traffic. Roads and snowroads will be maintained according to winter use standards (Appendices 5 and 6). Hazards will be adequately signed. Speed limits and other motor vehicle and snow vehicle regulations will be enforced by ranger patrols. Snowmobiles will be regulated for safety and noise control (36 CFR 2.18). Chains or snow tires may be required on vehicles. All phones will be well signed, and an emergency number will be posted and reachable without depositing a coin.

Specific Areas

The following areas are included in the Developed Area Zone. Only Developed Areas with relatively high visitor use are detailed below:

Mammoth. Access is by wheeled vehicle only. Facilities include a staffed visitor center/ranger station, lodging (130 units in the Mammoth Hotel and Aspen Employee Dorm), restaurant, fast food, general store and campground. Low-cost dorm lodging is provided. Ski rental and instruction, snowmobile rental, guided bus tours, snowcoach and skier shuttle service, sleighride, ice skating, evening programs and interpretive tours are available. Snowmobile fuel, vault toilets, phone and warming hut are currently available at the Upper Terrace parking lot. All open visitor services that are handicapped accessible in summer will be maintained for handicapped access in winter.

Madison. Access is by snow vehicle only. Facilities include a seasonal warming hut with lunch counter, telephone, heated restrooms and designated campground. An unstaffed ranger station is nearby. Interpretive tours are available.

Old Faithful. Access is by snow vehicle only. Facilities include a staffed visitor center, unstaffed ranger station, lodging (78 units in Snowlodge, Obsidian Dorm and cabins), restaurant, fast food, gift shop, ski shop, gas station and designated campground. Ski rental and instruction, snowcoach and skier shuttle service, evening programs and interpretive tours are available.

Grant Village. Currently Grant Village is used for administration purposes and contains a designated winter campground.

West Thumb. Access is by snow vehicle only. A warming hut with vending machines and vault toilets are available. Interpretive tours are available.

Lake Village/Bridge Bay. Currently the Lake/Bridge Bay developed area is used for administrative

purposes only. The ranger station is unstaffed.

Fishing Bridge. A cabin at the Fishing Bridge Campground, approximately one mile from the junction, is used as a warming hut. Vault toilets are located at the warming hut and 1/4 mile from the junction. Telephones are located near the warming hut and at the Cascade Picnic Area. There are no other services in the area.

Canyon. Access is by snow vehicle only. The area contains a seasonal warming hut with lunch counter, gas station, flush toilets, commercial fixed base camp and ranger station (ranger's residence, staffed part-time). Interpretive tours are available.

Tower/Roosevelt. Access is by wheeled vehicle only. The area contains a ranger station (staffed part-time from adjacent ranger residence), vault toilets and a telephone. The Roosevelt Lodge is opened for Sunday buffet only. Skier shuttle from Mammoth is available to ski trails in this area. Some interpretive tours are available.

Roads. Roads are plowed from the North Entrance to the Terrace Loop Drive south of Mammoth Hot Springs, and from Mammoth through the Northeast Entrance to Cooke City on the Beartooth Highway (a total of 57 miles).

Snowroads. Snowroads include major park roads opened to visitors in the summer between the Upper Terraces at Mammoth and Norris Junction, Norris Junction and Madison Junction, Madison Junction and the West Entrance, Madison Junction and West Thumb Junction, West Thumb Junction and the South Entrance, West Thumb Junction and Canyon Junction, Fishing Bridge and the East Entrance, Canyon Junction and Washburn Hot Springs, and Canyon Junction and Norris Junction. Currently the following side roads, opened to visitors in the summer, are also available for oversnow travel: Virginia Cascade Drive, Fountain Flat Freight Road, Firehole Canyon Drive, Grandview Point Drive and Artist Point Road. Thermal areas accessible by oversnow vehicles include Norris Geyser Basin, Fountain Paint Pot, Midway Geyser Basin, Biscuit Basin, Black Sand Basin, Old Faithful, West Thumb and Mud Volcano.

THRESHOLD ZONE

Threshold areas are highly accessible or highly attractive natural areas that are managed for relatively high-density nonmotorized visitor use. The boundaries for the Threshold Zone match the boundaries for the Natural Zone in Yellowstone's Master Plan. Threshold areas contain boardwalks, overlooks and interpretive trails. Others are popular ski touring areas that are specially mapped, signed and maintained for safety and ease of travel. Areas designated as proposed wilderness will not be designated as threshold areas.

Resource Protection

Visitor use in geothermal areas will be restricted to boardwalks and trails developed for summer travel or as designated under ranger lead interpretive activities. Travel will be controlled to minimize displacement of wildlife, destruction of vegetation, and impacts on other resources. Although some habituation of wildlife may occur, use will be concentrated to minimize disturbance of wildlife. No displacement of threatened or endangered species will be permitted. Off-trail travel may be prohibited in any threshold area to protect wildlife.

Visitor Uses and Access

Travel will be by foot, ski or snowshoe. Motorized access is permitted for administrative purposes only. Machines may be used to maintain paths, boardwalks, overlooks and ski trails according to guidelines in Appendices 7 and 8. Designated ski trails will be specially signed and marked, and maps will be provided. Area maintenance plans will be prepared designating all travel routes to be maintained.

Facilities and Services

Vault toilets, picnic tables and other related facilities may be available in winter as they are in summer. Seasonal fixed base camps will not be placed within threshold areas. Camping will be regulated under the backcountry permit system and will be permitted only in designated areas where it would not impact the experience of other visitors. At a minimum, vault toilets are required in any designated winter campground in threshold areas.

Interpretation and Visitor Information

Printed and verbal information and interpretive activities will be provided as specified. Existing structures may be used for interpretive purposes.

Visitor Protection and Safety

Ranger patrols will provide visitor protection and enhance safety. Safety will be promoted through signing, printed and verbal information, maintained ski and foot trails, and cleared boardwalks and overlooks.

Specific Areas

The following areas are included in the Threshold Zone. Only Threshold Areas with relatively high visitor use are detailed below:

Mammoth. The area currently contains a thermal area with interpretive trails and brochure, maintained ski trails with map, and a thermally fed bathing area along the Gardner river. Vault toilets and a warming hut (no food service) are provided at Indian Creek. Off-trail travel may be prohibited in portions of Swan Lake Flat to protect wildlife winter range.

Norris. Current development consists of interpretive trails with brochure, telephone and vault toilets. Camping may be permitted in the Norris campground by backcountry permit.

Madison. Travel in wildlife habitat along the Madison River may be restricted to protect wintering and nesting waterfowl as well as elk and bison.

West Entrance. A maintained ski trail with map is available.

Fountain Paint Pots. Development consists of interpretive trail with brochure and vault toilets.

Old Faithful. The area contains maintained boardwalks, foot paths and ski trails. Interpretive tours, interpretive brochure and area ski map are also available. Vault toilets are located at Morning Glory Pool. Boardwalks on Geyser Hill to Castle Geyser are maintained for safe foot travel.

West Thumb. Interpretive trail and interpretive tours are available. The upper boardwalk loop is maintained for foot travel.

East Entrance. A ski trail without map is available.

Mud Volcano. Interpretive trails, interpretive brochure and vault toilets are available.

Canyon. Maintained ski trails and overlook paths are provided. Interpretive brochure and tours are also available. There are vault toilets at Artist Point. Overlooks at Grandview, Lookout Point, Brink of Upper Falls and Artist Point are maintained for foot travel. A view of the Upper Falls from Uncle Tom's is also maintained.

Tower-Roosevelt. Existing Conditions. Maintained ski trails with map are serviced by a skier shuttle service from Mammoth. Interpretive tours in the area originate at Mammoth.

Northeast. Existing Conditions. Two ski trails with ski map are available.

BACKCOUNTRY ZONE

For winter use, all lands not designated as developed or threshold areas are in the backcountry zone. Use of the backcountry is expected to be low density, and is regulated by the backcountry camping permit system to control visitor impacts and prevent conflicts. Visitors who desire a high degree of solitude may plan their trips to avoid encountering evidence of other parties by using information available through the permit system.

Resource Protection

No impacts on natural or cultural resources will be permitted. Visitor uses will not permanently displace, habituate or otherwise impact wildlife. Wildlife may be protected by restricting off-trail travel or by closure. Food storage, garbage and human waste disposal will be regulated as in summer. In addition, human waste will be disposed of at least 100 feet from any designated campsite and toilet paper will be burned or packed out. Wood fires will not be permitted. Regulation of party size and length of stay will be governed by year-round regulations, except where different winter use limits are approved by the Superintendent and published in the *Yellowstone Backcountry Campsites* (YELL 475) or a similar winter publication.

Visitor Uses and Access

Travel will be by ski, snowshoe or foot. Motorized travel is permitted for emergency administrative purposes only. Marking, signing and overhead clearance may be improved according to ski trail maintenance guidelines. No motorized grooming will be used to maintain ski trails.

Facilities and Services

There will be no facilities in the backcountry except those in place for summer use (some backcountry cabins, vault toilets and picnic tables). Seasonal fixed base camps will not be permitted. Camping will not be restricted to designated sites except where specific winter sites are necessary for resource protection or dispersal of use. Where sites are designated, they will be approved by the Superintendent and published in YELL 475 or a similar winter publication. Except in summer developed campgrounds, camping will not be permitted within sight of a road or snowroad.

Interpretation and Visitor Information

Resource protection and visitor safety information will be available for backcountry users. Popular ski trails can be specially mapped for skiing. Interpretive tours may enter the backcountry.

Visitor Protection and Safety

Search and rescue will be provided. Backcountry visitors must be prepared to administer first aid and assist in evacuation. Trail signs and markers may be maintained for visibility during winter. Dangerous and unavoidable sections of popular trails may be modified in accordance with Appendix 8. Printed and verbal information will be provided while issuing the required backcountry camping permit. The permit will show planned itinerary, including trailhead and campsite numbers, even though camping will not be restricted to designated sites. Visitors will be required to sign a checklist (Appendix 10) to show that they have received and understood all necessary safety information.

page 33 is blank

CHAPTER 7 CURRENT WINTER OPERATION, DEFICIENCIES AND POTENTIAL NEEDS

The existing Yellowstone winter program outlined in this document is designed to provide visitors with a safe, enjoyable experience while protecting the park's resources. This section discusses the current program in terms of how well the National Park Service is able to meet the outlined program's goals and objectives. Aspects of the winter program are described in detail to illustrate the range and complexity of visitor services provided and to identify the deficiencies and needs of the current operation.

NPS operations greatly affect the quality of a visitor's experience and the amount of resource protection offered. Because funding has never been received for carrying out necessary winter operations, the current program must be financed by diverting money from the park's summer operation. This funding method affects the quality and quantity of both the summer and winter programs, forcing cutbacks in the summer operation and creating a winter operation that has never received enough money to meet acceptable standards. Funding deficiencies and needs of the current winter program are discussed in detail. Appendix 2 details budget information presented in this section for NPS staffing levels, facilities, transportation services and emergency services. All needs identified for facilities and services are tentative pending completion of the Winter Use Plan.

NATIONAL PARK SERVICE OPERATIONS

Operations are outlined by NPS division in order to clarify how the current program functions: Resource Management and Visitor Protection, Maintenance, Interpretation and Research. Although the park is faithfully served by a group of competent, dedicated employees, *there are serious shortfalls in the current winter operation.* In particular, staffing levels are not adequate to meet acceptable standards for visitor and resource protection, visitor information, and facility maintenance. The park's natural resources may also be suffering because research information is not available to guide resource managers. Significant increases in visitation continue to place increasing demands on park operations during the winter.

Resource Management and Visitor Protection

The Resource Management and Visitor Protection Division is responsible for the management and protection of the park's wildlife and other resources through monitoring, law enforcement, and resource management action; and for the protection of visitors and employees by providing emergency services and law enforcement. Rangers must maintain a high level of proficiency in many technical skills.

Winter duties are diverse. Rangers may be involved in snowmobile patrol, road patrol, ski patrol and ski trail maintenance; emergency medical care and transport, search and rescue, accident or incident investigation, and violator contacts involving warnings, citations, arrests, incarcerations and court appearances; wildlife monitoring and management; weather records, snow course surveys, and avalanche condition monitoring and control; structural fire response; and assisting other agencies.

All entrance stations except Northeast are staffed at least part-time in winter. Rangers collect fees, hand out a winter map/brochure and provide basic information, including weather and road/snowroad conditions. When a station is unstaffed, a supply of maps/brochures is left in a box below the station window. At the North Entrance, a travelers' information station continuously broadcasts basic winter information on AM radio frequency 1610 kHz.

Backcountry information and permits are available at the Mammoth and Old Faithful Visitor Centers; the West, South, East and Northeast Entrance Ranger Stations; the Tower Ranger Station; and the Canyon Warming Hut. All backcountry permits are issued in person by a ranger.

The cost of the current Resource Management and Visitor Protection winter operation is $275,000, which accounts for 23 permanent and 11 seasonal rangers, support services, equipment and supplies. There are serious shortfalls in the current winter operation for the Resource Management and Visitor Protection

Division. Visitor and employee protection, welfare, and safety are being compromised; the wildlife and other resources do not receive the high level of protection and management they need; and the valuable and historic structures are threatened by inadequate fire response. In order to bring the Resource Management and Visitor Protection operation up to acceptable standards, an additional $212,200 is required above the $275,000 currently diverted from summer operations. At least 13 additional winter ranger positions are required. This will allow each major area to provide at least 12 hours per day (7:00 a.m. to 7:00 p.m.) of road or snowmobile patrol; ski patrol at least once per week; maximum number of hours of positive cost/benefit ratio of entrance station fee collection; necessary monitoring and management of resources, including wildlife resources such as bison, elk and bighorn sheep; and 24 hours per day/7 days per week emergency response.

Maintenance

The Maintenance Division is responsible for maintaining roads, oversnow travel routes, buildings, utility systems and other park facilities. Maintenance personnel carry out the following winter duties: plow 70 miles of road four or more times per week; groom 200 miles of unplowed roadway for oversnow travel at least three times per week; maintain and operate water and sewer utility systems at major developed areas; maintain 118 vehicles associated with the winter operations, including 75 snowmobiles, 7 groomers, 3 oversnow utility vehicles, snowplows and trash compactors; maintain about 55 operating buildings in the interior of the park and many more at park headquarters; haul, compact, store and dispose of garbage; keep many walkways, steps, and popular viewpoints clear of snow and hazardous conditions; and provide avalanche control at critical locations.

The cost of the current Maintenance Division operation for the winter is $534,100 which accounts for 20 employees, equipment amortization and replacement, vehicle maintenance, shop operations, electricity, fuels, supplies and materials. Notable deficiencies exist in winter maintenance operations. Roads and oversnow travel routes, visitor facilities, and viewpoints are not maintained to high standards, potentially compromising public safety. The park's buildings and facilities do not receive maintenance at appropriate intervals, threatening their continued utility and value. Park employee housing is crowded and in poor condition. currently, there are not enough personnel available to clear building roofs of heavy snow as frequently as necessary. The snow accumulates to more than 6 feet, threatening the structural integrity of the building and the welfare of any occupants. Unless groomed daily, the heavily used oversnow travel routes become extremely rough with choppy moguls capable of throwing drivers and passengers from snowmobiles and causing severe injuries. At the very least, the rough routes are certainly uncomfortable and detract from a positive park experience. The current system of compacting and storing garbage in compactors in the snowbound interior is now stretched to its volume limit.

In order to bring the maintenance operation up to acceptable standards, an additional $447,430 is required above the $534,100 currently diverted from summer operations. At least 15 additional employees are required for the winter operation. This level of staffing, combined with the acquisition of additional required equipment, would allow division personnel to plow roadways when necessary to provide safe automobile travel; groom oversnow routes more frequently, to improve public safety and comfort; maintain public buildings and viewpoints; and maintain other facilities on a daily basis to meet health and safety standards and provide for public comfort and convenience. In addition, increases in staff are needed to operate utility systems; safely maintain vehicles, snowmobiles and heavy equipment; provide for adequate garbage compaction, storage and removal; maintain and upgrade park housing and administrative facilities; and clear snow from roofs of buildings, as required to maintain structural integrity and human safety.

Interpretation

The Interpretation Division's winter program responsibilities are to staff visitor centers and warming huts, provide visitor information, and enhance visitor enjoyment and understanding of the park. Information is supplied to encourage safety, minimum resource impacts, and compliance with regulations. Visitor contacts provide information on public safety and protection of natural systems during a season when each contact can be vitally important.

Visitor Centers are open daily at Mammoth and Old Faithful. Paid and volunteer interpreters provide literature, films and slide shows, as well as verbal information, including weather, road, and ski conditions. Evening programs are offered several nights per week, and interpretive activities on foot, ski and snowshoe are offered throughout the week. Warming huts at Madison, Canyon and West Thumb are staffed by naturalists five to seven days per week. The naturalists provide information at the warming hut and give tours on snowmobile, ski or foot.

The park provides free maps for maintained ski trails at Old Faithful, Canyon, West Entrance, Mammoth, Tower Junction and Northeast Entrance. At major scenic areas such as geyser basins and the Grand Canyon of the Yellowstone, interpretive brochures are available year round.

The cost of the current Interpretation operation is $45,000 accounting for eight seasonal employees, operation of two full-service visitor centers and three warming huts that serve as winter visitor information centers.

Significant shortfalls in personnel and equipment are evident in the division's ability to have top-notch visitor information services as would be expected in the world's first national park. Warming huts which serve as vital information stations and as places to report emergencies cannot be staffed seven days a week. Visitor centers rely heavily on less-trained volunteers, compromising the quality of visitor information. Programs cannot be offered with as much frequency or variety as would be commensurate with the public interest in and the prominence of Yellowstone National Park. This negatively affects the park's ability to enhance visitor enjoyment and understanding of the park.

The winter interpretive operation should be funded at the $127,700 level. This is an addition of $82,700 over the $45,000 currently diverted from summer programs. This funding would allow the division to provide the required personnel, materials, supplies and equipment to meet acceptable standards. In order to provide a high quality program for visitors, nine additional winter employees are required to staff visitor centers and warming huts, furnish visitor information, and provide more varied and frequent programs. It is vitally important to both public safety and the protection of natural systems to enhance visitor understanding through as many personal contacts as possible during the winter.

Research

Resource management must be guided by research and resource monitoring. Resource management efforts continue to focus on prevention of adverse impacts caused by human use. Management measures, including area closures and use restrictions, are implemented in identified problem areas.

Prior to the start of the winter use planning effort, Yellowstone had no ongoing research projects aimed specifically at identifying the current and potential impacts of winter use. The explosion of winter use activities in the park has raised many questions about the impact of those activities on park resources, especially wildlife. The few projects that have been completed to date have raised more questions than they have answered.

Research is needed to determine what resources are being affected, to what extent, and how such impacts can be avoided. Although a preliminary list of research and resource monitoring needs has been identified, funding is required to begin work on priority issues and continue inventories of existing and potential resource impacts (Appendix 3). Major research efforts are necessary to assemble and synthesize pertinent literature and collect baseline data and develop monitoring methodologies. There are currently not enough personnel to perform the needed research projects or to support day-to-day resource management. There are also ongoing operational programs carried out during the winter that rely on special funding. A science program needs to be established that is responsive to management's winter needs with a base-funded program.

An optimum winter research program requires $110,000 of additional funding. This level of funding would

allow the research operation to provide the personnel necessary to perform research concerning the impacts of winter use on wildlife and for the selection of independent research projects. Research will be conducted to provide baseline data and measure impacts. A controlled system of observation by qualified park personnel will be developed and implemented to assist in collecting data.

NPS Operations Summary

The following table summarizes the current cost of the National Park Service winter program and the additional funding required to reach an acceptable winter program. Prior to opening the park to rapidly expanding winter visitor use, each NPS Division had a number of permanent employees who returned to park headquarters after the busy summer season for planning and/or maintenance activities. Those positions are not included in this summary. The summary shows (1) the cost of the current winter operation, money that has been taken from summer programs, and (2) the additional program requirements necessary to bring the winter operation up to acceptable standards.

Division	Current Operation	Additional Requirements	Total
Resource Management & Visitor Protection	$275,000	$212,200	$487,200
Maintenance	534,100	447,430	981,530
Interpretation	45,000	82,700	127,700
Research	_____	110,000	110,000
Total	$854,100*	$852,330	$1,706,430

*This amount is currently taken from the summer operation to support the winter operation.

FACILITIES AND SERVICES

Visitor and employee facilities and services greatly affect the quality of Yellowstone's winter experience. This section identifies the deficiencies and needs of visitor accommodations, visitor contact stations, employee facilities, and transportation and emergency services. All recommendations for facilities are tentative pending completion of the Winter Use Plan, with public involvement and appropriate compliance actions. Under current concession contracts, some concessioner-operated equipment and facilities are partially or completely funded by the NPS. Only those facilities and services that the NPS is financially responsible for are discussed in this section.

Facilities

The impacts of an evolving winter program are probably most evident in the deficiencies that exist in the park's facilities - both visitor and employee facilities. The total requirement to bring facilities up to acceptable standards is estimated at $12,837,000. Itemized costs appear in Appendix 2.

Visitor Accommodations. The Old Faithful and Mammoth areas are focal points for the overnight visitor. Food and lodging are available at Old Faithful (78 rooms) and Mammoth (130 rooms). Lodging areas are kept small and isolated to improve the visitor's winter experience. Food service, guided tours, and a variety of other services are available to allow visitors to have a safe and enjoyable experience. All lodging is in buildings that were originally designed for summer use only. Some winterization has been accomplished and some visitors at both locations are lodged in rooms designed and used as employee housing in the summer.

Lodging at Old Faithful needs to be rehabilitated or replaced; 10 winterized cabins currently provide the only acceptable means of visitor accommodations. The Snowlodge kitchen is too small to meet the needs of the growing number of visitors. Its proximity to the dining room seating creates a less than desirable atmosphere for guests. Kitchen noises and employee conversations carry into the dining room. Seating in the dining room is limited, causing long waits for visitors, especially at lunchtime. Although the lobby is used for reservations, as a waiting area for snowcoach loading, and as a place to relax in the evenings, it is extremely small and in no way resembles a winter lodge atmosphere. The lounge can accommodate no more than 20 people. Guest rooms located directly above the dining room and lounge are very noisy. The lodge's employee dining room is an old trailer attached to the Snowlodge and is also inadequate.

The Four Seasons Snack Shop at Old Faithful is old and needs to be replaced. It is the only other facility, in addition to the Snowlodge dining room, open for lunch and is located in a less than desirable area in major traffic flow. The facility would require major rehabilitation if it were to remain in service. Future plans call for removal of the facility, a replacement facility is needed to meet growing visitor demands.

Two additional garbage compactors/storage units are needed at interior locations where garbage cannot be removed until after spring plowing.

Snowmobile and snowcoach arrival and departure, as well as skiing activity, have swamped the Upper Terrace staging area in Mammoth. Improvements are necessary to separate the following functions: (1) snowcoach and snowmobile arrival and departure, (2) snowmobile rental and storage, (3) parking for day use snowmobiling and skiing, (4) shuttle service from the staging area to the Mammoth Hotel, and (5) refueling.

Visitor Contact Stations. The Old Faithful Visitor Center needs to be winterized and have a properly designed heating system installed. Winterization is not a simple task because the building's unique design yields much unusable space.

Warming huts are provided at five locations: two are in trailers moved in for the season; the other two are in historic log ranger stations and one in a relocated cabin. Warming huts are staffed at Madison, West Thumb and Canyon. Unstaffed huts are located at Fishing Bridge and Indian Creek. Emergency phones and food service (vending machines and/or staffed service) are provided at all locations except Indian Creek.

Warming huts need to be improved at three locations. Specifically, the Canyon and Madison huts need to be doubled in size, and food service (concessioner operated) needs to be expanded. The warming hut at Fishing Bridge needs to be moved from its present location in the log ranger station at the campground to a location on the Grand Loop Road near Fishing Bridge Junction. This would be accomplished with a trailer, moved in and out each winter as at Canyon and Madison.

The south entrance needs a small winterized building to serve as an entrance station and visitor contact facility. An additional vault toilet is also needed.

Employee Facilities. All employee housing was constructed during an era when there was no winter use. Units are improperly sized, insufficiently winterized, and lack sufficient storage. No facilities for winter social activities, exercise or community functions exist for personnel isolated in the park. Some deficiencies can be corrected with minimal increases in repair and rehabilitation funding, others will take a major phased construction program to correct. Properly designed winterized housing is necessary at each remote area to better serve park employees who are essentially on call 24 hours a day (above the call of duty).

These units should include sufficient storage for both food and personal items: trips to town are kept to a minimum because of oversnow travel, often in hazardous conditions.

Vehicle storage facilities are needed for employees working in the interior of the park to keep vehicles at the entrances or beyond. Often these vehicles need to be shoveled out and then won't start due to sub-zero

temperatures. Proper weatherproof storage is also needed for government and personal snowmobiles.

Currently Old Faithful does not have an adequate facility to store and maintain grooming equipment and snowmobiles. A properly designed facility needs to be built to allow Old Faithful maintenance staff to carry out equipment upkeep and other maintenance functions throughout the winter.

A Winterized Ranger Station needs to be provided at Grant Village, enabling NPS staff to have a station as an office and potential contact station for visitors. Grant Village/West Thumb staff currently work out of their homes. The ranger station could be winterized, giving winter employees a much needed working area.

Transportation Services

Almost all the park's popular summer attractions are accessible in the winter to motorized vehicles. Wheeled vehicles can travel between Mammoth (north entrance) and Cooke City, Montana (northeast entrance). Concessioner-operated snowcoach transportation takes visitors to the Old Faithful Snow Lodge from the south entrance, west entrance and Mammoth. Snowcoach and snowmobile guided tours of the park are also available. The most popular mode of transportation is the private or rental snowmobile, as evidenced by the increasing number of group tours and rentals. At this time, handicapped access is available at Mammoth only.

Skiing has become an increasingly popular way to see Yellowstone. Concessioners rent ski equipment and give instruction. Shuttle services to popular trailheads are also provided.

This section itemizes equipment purchases needed to support a quality winter transportation system. A total requirement of $1,691,800 is needed to bring Yellowstone's transportation services up to acceptable standards. Annualized equipment repair/replacement costs are then needed to maintain the system. An additional $276,280 is required for annual replacement costs. Financial details of the one-time equipment purchases and annualized replacement costs appear in Appendix 2. Under current concessions contracts, half of the concessioner-operated snow coaches are funded by the NPS.

To provide additional snowroad patrols and transportation for additional personnel, 32 single-track snowmobiles, 10 cargo sleds, 25 snowmobile suits, and 70 helmets are needed. The new helmets provide hearing protection and radio communications capability and would be provided to all personnel riding on snowmobiles. The improved communication that would result would greatly decrease emergency response time and assist in law enforcement.

Thirteen double-track snowmobiles are needed to replace older machines and add capability to travel uncompacted snow for emergency response, evaluation of avalanche conditions, snow course sampling and maintenance, and resource management projects. Double-tracks are also used to groom ski trails where permitted.

The concessioner operates a fleet of snowcoaches (full-size oversnow vehicles carrying 10-12 passengers). Most of these are over 20 years old. Because replacement parts are not available, coaches are being taken out of service in order to provide parts to keep the others running. The 22 coaches currently in service are barely adequate to transport guests to and from Old Faithful. Replacement snowcoaches currently cost $110,000 per unit and are subject to wide fluctuations in exchange rates. The following purchase schedule allows for limited production capacity of the factory and establishes a staggered replacement schedule:

6 coaches per year for first 3 years
4 coaches in the fourth year
2 coaches per year thereafter (replacement)

An additional snowroad groomer is required to reduce and more evenly distribute the burden on existing personnel and machines. With the additional machine, the park would be able to maintain acceptable snowroad conditions in heavily traveled areas and there would be no lapse in service should one of the

other groomers break down.

Three snowblowers are needed to clear walkways and overlooks. Loader-mounted snowblower attachments are also needed at Old Faithful, Lake, Canyon and Grant Village to help keep employee quarters and maintenance areas clear of snow. These loader attachments will also assist in clearing snow from developed areas during spring opening.

Emergency Services

Emergency services include all medical, search and rescue, and fire protection operations provided by Yellowstone's ranger staff. A total of $634,000 is needed to bring Yellowstone's emergency services up to an acceptable level. Annualized replacement costs of $38,700 are then needed to maintain this system. Detailed budget information on necessary equipment purchases appears in Appendix 2.

To transport critically ill or injured people, the park currently has three options: rely on outside helicopters, which depend greatly on good weather in an area known for its inclement winter weather; commandeer a slow and bumpy concession snowcoach, perhaps displacing park visitors; or transport in an open cargo sled towed behind a snowmobile over rough routes. At least two covered, heated ambulances for oversnow emergency medical transport are needed immediately.

Existing search and rescue equipment is old and in short supply. Rangers must supplement National Park Service equipment with their personal equipment whenever they are called out. A rescue cache needs to be provided for each ranger subdistrict. Adequate caches will include ski equipment, snowshoes, avalanche probes, beacons, litters, rescue sleds, packs, tents, sleeping bags and mountain rescue equipment. Double-track snowmobiles would allow rangers to travel in uncompacted snow for emergency response.

Fire fighting capability is hampered by snow as well as lack of personnel. No apparatus is available in the park for oversnow fire fighting, posing a serious threat to many historic and extremely valuable structures. An oversnow response unit, including a pump and water tank, must be placed at each developed area. Two large units, consisting of a full-size oversnow vehicle, trailer, 260-gallon, 170-psi tank and 250-gpm pump will be placed at Old Faithful, and any area undergoing winter construction. Smaller units will be provided at all other developed areas that are occupied in winter. Fire hydrants must also be enclosed and provided with hose to improve firefighting readiness from the exterior of buildings. Fire protection equipment must be installed in structures that are not adequately protected.

WINTER PROGRAM OPERATIONS SUMMARY

The following table summarizes the cost of current Yellowstone winter operations and the additional funding required to reach an acceptable winter program. Costs are outlined for staffing, equipment, facilities, transportation and emergency services. The summary shows (1) the cost of the current winter operation, money that has been taken from summer programs, and (2) the additional program requirements necessary to bring the winter operation up to acceptable standards.

Total Yellowstone National Park Winter Budget Request

NPS Division/ Facilities & Services	Current Budget	Required One Time Budget	Required Annual Budget
Resource Management & Visitor Protection	$ 275,000		$ 487,200
Maintenance	534,100		981,530
Interpretation	45,000		127,700
Research	0		110,000
Facilities		12,837,000	0
Transportation		1,691,800	276,280
Emergency Services		634,000	38,700
TOTAL	$ 854,100*	$15,162,800	$2,021,410

* This amount is currently taken from the summer operation to support the winter program.

CHAPTER 8 FUTURE PLANNING

PURPOSE AND NEED FOR A WINTER USE PLAN

A thoughtful and comprehensive analysis of winter operations in Yellowstone must continue. This document serves as an inventory and needs analysis as well as an aggregation of existing management guidelines for the immediate future. It also serves as a baseline for the Winter Use Plan. As discussed in the introduction of this report, the National Park Service has decided to do a joint Winter Use Plan for Yellowstone and Grand Teton National Parks and John D. Rockefeller, Jr. Memorial Parkway.

The Winter Use Plan will include a comprehensive analysis of winter use, environmental consequences, changes to existing services and facilities, and changes regarding additional services and facilities. Management guidelines for the long term will be spelled out. Alternative solutions to a broad range of management issues will also be addressed in an environmental assessment. Issues will be identified in the public scoping process outlined below, and in the list that follows.

A 1985 article in *National Parks* magazine captures the direction the Winter Use Plan must take (Whitney, 1985):

> "Yellowstone's Winter Use Plan will be the first of many such plans for the national parks. It will serve as the standard by which future plans are judged. Therefore, it is critical that the Yellowstone plan be of the highest professional quality and be sensitive to the role our parks play as places for spiritual renewal, as well as for recreation.
>
> "Winter use of our national parks presents an opportunity and a challenge for the National Park Service. The opportunity is to offer distinctive and rewarding park experiences to more and more visitors even as summer crowds approach the limits of park capacity.
>
> "The challenge is to manage increasing winter use without impairing the visitor experience or park resources. This challenge can only be met if the parks take a thoughtful - and comprehensive - look at winter use management."

ISSUES

The following is a list of issues that describe future proposed uses, restrictions on existing uses, as well as resource management concerns. These issues are intended to be general in nature and require alternative solutions, comprehensive analysis and possibly additional research before a prudent solution can be attained. This planning process will involve much public discourse, as outlined in the section on Public Participation.

The issues identified in this section should not be placed in the same category as the deficiencies and needs described in Chapter 7. Those deficiencies and needs will be corrected as funding becomes available and in accordance with NPS compliance standards.

Resource Protection Issues

Several types of land use currently exist during winter in Yellowstone. As a result, summer land use management zones do not match winter land use practices. In an effort to manage winter uses based on a zone concept, a zoning system tailored to the special needs of winter should be developed.

In some areas within Yellowstone, use levels and management actions have altered the distribution and productivity of wildlife. The magnitude and significance of these impacts need to be addressed by the park's Resource Management and Research Divisions. Mitigating measures to reduce impacts on wildlife

need to be considered. Those measures should consider options of modifying visitor use patterns, restricting the number of visitors, and increasing education and law enforcement programs. A graded system of management measures could be developed to protect sensitive areas.

The effects of visitor use on some wildlife populations is not known. Baseline data needs to be obtained on these species so that the park can begin to determine if any impacts are being made and what, if anything, should be done to avoid identified impacts.

The larger animals tend to travel on roads and snowroads because travel is easier on the hard surface. They often run ahead of vehicles rather than move off into deep snow. Research needs to be conducted to determine whether energy expenditures caused by this action affect individual mortality or population numbers.

If winter use in Yellowstone continues to increase, conflicts between impacts on resources and visitor uses will need to be resolved by setting priorities, balancing resource protection and visitor use.

The threatened grizzly bear, as well as the more common black bear, could be affected by visitor uses. Bears are particularly vulnerable when they emerge from their dens in late February through mid-April and just prior to denning in early October through early December. As visitor use increases during these more vulnerable seasons, policies need to be developed to prevent, as much as possible, bear-human conflicts.

With increased use of Yellowstone during the shoulder seasons, visitor impacts on wildlife should be monitored. Other resource impacts that should be considered for shoulder seasons include erosion and damage to flora from hiking when the ground is wet and unstable.

Visitor experience needs to be closely examined. The quality of a visitor's experience is closely linked to encountering the park under relatively uncrowded conditions. Crowding on ski trails and snow machine routes needs to be examined. As an example, the snowroad between West Yellowstone and Old Faithful is perceived to be overcrowded by some. Regulation on the numbers of visitors using an area may be considered.

Noise and visual impacts have also been identified as issues affecting a positive park experience. How much noise is too much noise? Creative solutions to difficult problems will need to be developed.

Visitor Uses and Access Issues

New recreational uses could be proposed for Yellowstone. The park needs criteria for deciding what uses are appropriate.

Plowing additional roads within the park may be considered.

The high cost of concessioner-operated oversnow transportation must be evaluated.

Yellowstone's role in the proposed Continental Divide Snowmobile Trail needs to be examined.

It is National Park Service policy to provide handicapped access wherever facilities and programs are provided for nonimpaired visitors. In each visitor use area, five percent, or a minimum of one accommodation must be made accessible. Programs must be made accessible to the mentally-, visually-, hearing-, and mobility-impaired.

Facilities and Services Issues

Overcrowding is a consideration for overnight accommodations. The infrastructure set up to handle developed areas will limit lodging development. Limits on the number of lodging units to be opened in any

location in winter should be considered. Ceilings created for overnight accommodations may eventually prevent some visitors from visiting the park in the winter.

If additional overnight accommodations are to be opened, which location should be developed and what type of accommodations should be provided? Canyon has been suggested as a possible location, given an analysis of demand and impacts.

There have been few problems with commercial and educational uses to date, but a potential exists for guides to impact resources and conflict with other visitors' use and enjoyment of the park. The presence of large commercial/educational groups may detract from the experience of other visitors and cause hazards on snowroads as faster riders attempt to pass the group.

The impacts and policies governing the establishment of fixed base camps should be examined.

The need for additional warming huts or permanent structures to replace seasonal huts should be analyzed.

Interpretation and Visitor Information Issues

Visitation at the West Entrance warrants additional information services, such as a joint NPS/Chamber of Commerce information center in west Yellowstone or an unstaffed kiosk at the gate.

Increased interpretive services are justified by current visitation. If visitation increases, interpretation services should correspondingly increase.

Special winter exhibits should be developed for all visitor centers and warming huts.

Warming huts should be staffed with interpretive rangers to match visitor use.

Visitor Protection and Safety Issues

Entrance Stations should be operated at least eight hours per day while accommodations are available in the park. The park map/brochure should be improved in the areas of energy information, safety warnings, treatment of wildlife, and facilities and services available.

Day users are not contacted and monitored. Day users may have the mistaken impression that signing a trailhead register will cause rescue efforts to be initiated if they are overdue. Visitor protection and safety issues need to be examined to determine how inadequacies in the park's emergency system should be addressed.

PUBLIC PARTICIPATION

For a planning project such as this one, with its regional as well as national interest, public input is crucial. Regardless of policy direction or requirements of the National Environmental Policy Act, public involvement makes good sense because it:

- identifies and presents local versus national issues
- educates
- builds support for what the NPS is doing
- determines user preferences and why preferences exist

However, most important, is to allow the National Park Service the opportunity to present its mandate and management objectives for winter use and allow the public the opportunity to compare those with their own expectations.

The current strategy for public involvement for this planning process is outlined below.

Scoping (Issue Identification)

The purpose of scoping is to find out what the public, special interest groups, and State, Federal, and local agencies think the issues and problems are. It will also help park management gain some insight into how the public thinks the park should be managed in the winter. Scoping also helps to identify controversies and perceived impacts.

Comment on this report is not what the National Park Service is specifically seeking, although this document serves as a catalyst to increase and expand public input that has already begun. For the past several years an open discourse has taken place on winter use in Yellowstone in a variety of forums. Scoping will be performed in the following ways:

- "open houses" in gateway communities with participation by the general public and interest groups
- a newsletter to gain input from beyond the region
- meetings with potentially affected local, State, and Federal agencies
- meetings with park staff and concessioners

After these meetings and workshops have occurred, a newsletter summarizing input will be sent to all participants.

Alternative Formulation

Once it becomes clear to the National Park Service that alternative solutions are evolving for various issues, public response will be solicited. Stage II will help the planning process by:

- finding out how the public reacts to the alternatives
- reducing the number of alternatives requiring further study
- helping to indicate the complexity of the issues and potential solutions
- finding out some of the impacts of a given solution
- reducing surprises - allowing the public to see what the plan might be like
- assuring an adequate range of alternatives will be addressed.

Preliminary alternatives will be presented to the public by way of a newsletter. Open house sessions or meetings may be scheduled with interest groups if necessary.

Draft Plan/Environmental Assessment

Once a draft Winter Use Plan and accompanying Environmental Assessment has been completed, it will be issued for public input. Input will be received by way of a response sheet furnished with the document. The main emphasis of here is to find out people's reaction to the draft, and environmental impacts. Again, open house sessions or meetings may be scheduled to provide additional opportunities for input.

APPENDIX 1

CHRONOLOGY OF WINTER USE

The following list briefly outlines documented events that have taken place in Yellowstone during the winter season. No effort was made to resolve conflicting reports in the literature cited.

1887 Schwatka/Haynes Winter photographic expedition. [Wells, 1887]

1910 Chittenden describes opportunities for winter recreation. Chittenden, 1895]

1925 Woman spends season with winterkeepers at Old Faithful. [Brown, 1924]

1930s Gardiner to Lamar Valley plowed. [Paganelli, 1980]

1939 649 people visited the park one day in January. [Paganelli, 1980]

1942 or 47 Gardiner-Cooke City Road first plowed according to testimony of local citizen. [Winter Operation of Roads in YNP, 1968]

1949 Snowplanes first used for emergencies; 17 winterkeepers living in the park. [Paganelli, 1980]

1949 Snowplanes used for tours from West Yellowstone (19 trips, 35 passengers). [Halliday, 1955]

1949 Study of winter plowing done by Bureau of Public Roads concludes plowing too costly and travel unsafe. [Winter Operation of Roads in YNP, 1968]

1949 Only 5 miles from Gardiner to Mammoth plowed in winter. [Winter Operations of Roads in YNP, 1968]

1949 All approaches to park plowed by States except 22 miles into South Entrance and 60 miles into Northeast Entrance. [Hamilton, 1957]

1955 First snowcoach permit issued (to Snowmobiles, Inc. of West Yellowstone for trips to Old Faithful); 66 trips initiated carrying 507 passengers; 40 trips reach Old Faithful. [Halliday, 1955]

1958 Snow Survey Committee Report concludes winter plowing not practical. [Kenner, 1958]

1960 Commercially produced snowmobiles become available. [Paganelli, 1980]

1962 Mammoth-Cooke City road plowed; Yellowstone Park Company starts snowcoach tours from Mammoth. [Darby, 1974]

1964 First recorded private snowmobile trip in park: six Polaris snowmobiles. [Paganelli, 1980]

1966-67 56 miles between Gardiner and Cooke City plowed plus 9 miles in Mammoth area; 4,897 persons visit Old Faithful in winter. [Winter Operation of Roads in YNP, 1968]

1966-67 First "snow buggy" trip around Grand Loop, by Big Sky Snowmobile Club of Livingston. [Winter Operation of Roads in YNP, 1968]

1966-67 Yellowstone Park Company opens winter accommodations at Mammoth, buys snowcoaches from Snowmobiles Inc. of West Yellowstone, runs snowcoach trips to Old Faithful and Canyon, buys 12 snowmobiles for rental to guests. [Paganelli, 1980]

1967 Hearings on plowing park roads held (August 12, 1967) [Winter Operation of Roads in YNP, 1968]

1970 First grooming of roads for snowmobiling (from South to Old Faithful). [Paganelli, 1980]

1971 Snowlodge opens with overnight accommodations, ski rentals and limited interpretive program at visitor center. [Paganelli, 1980]

1973 All roads groomed except East Entrance road and Dunraven Pass; snowcoaches running between Mammoth and Canyon, Old Faithful and Flagg Ranch, Old Faithful and Canyon; snowmobile fuel available at Old Faithful. [Paganelli, 1980]

1974 Major increase in winter staffing. [Paganelli, 1980]

1974 First record of auto caravan tour along Mammoth-Cooke City road. [Paganelli, 1980]

1976 Mammoth Museum opens for the winter. [Paganelli, 1980]

1977 Regional snowmobiler and skier survey conducted as part of Greater Yellowstone Cooperative Regional Transportation Study. [1978]

1977-78 Warming hut opened at Canyon, staffed by ranger/naturalist; gas available at Canyon; eight snowmobile caravan tours conducted by volunteer Brian Swedeberg around Canyon North Rim. [Paganelli, 1980]

1978-79 51 snowmobile tours given by volunteer Brian Swedeberg at Canyon; food available at Canyon warming hut. [Paganelli, 1980]

1979-80 Warming hut opened at West Thumb; visitor information station opened at West Yellowstone. [Paganelli, 1980]

1979-80 Mammoth-Norris road plowed; snowcoach tours out of Mammoth not offered. [Paganelli, 1980]

1982-83 TW Services, Inc. opens winter accommodations at Mammoth.

APPENDIX 2

DETAILED BUDGET INFORMATION: NPS OPERATIONS AND FACILITIES AND SERVICES

Yellowstone National Park's current winter program relies on diversion of money from summer programs to winter operations. Consequently, winter staffing and equipment levels are not adequate to provide visitors with a high quality, safe experience. Additional NPS staffing is required, old and worn out equipment needs to be replaced, inadequate visitor and employee accommodations need replacement, visitor service areas need to be upgraded, emergency service equipment needs to be modernized and made adequate. The National Park Service would like to provide visitors with a safe, enjoyable experience as they visit Yellowstone in winter. To accomplish this goal, the following budget items are required.

SUMMARY OF WINTER USE COSTS YELLOWSTONE NATIONAL PARK NATIONAL PARK SERVICE DIVISIONS

NPS DIVISION	CURRENT BUDGET	REQUIRED BUDGET	SHORTFALL
Resource Management and Visitor Protection			
Personnel:			
Salary:	$215,870	$356,690	
Benefits:	19,130	33,310	
SUBTOTAL:	$235,000	$390,000	$155,000
[1]Equipment, Supplies and Materials	$ 40,000	$ 97,200	$ 57,200
SUBTOTAL	$275,000	$487,200	$212,200
Maintenance Personnel			
Salary	$155,330	$322,170	
Benefits	14,670	32,830	
SUBTOTAL	$170,000	$365,000	$195,000
[3]Equipment, Supplies and Material	$364,100	$616,530	$252,430
SUBTOTAL	$534,100	$981,530	$447,430
Interpretation Personnel			
Salary	$ 43,260	$100,760	
Benefits	2,640	10,240	
SUBTOTAL	$ 45,000	$111,000	$ 66,000
[2]Equipment, Supplies and Materials	$000,000	$ 16,700	$ 16,700
SUBTOTAL	$ 45,000	$127,700	$ 82,700
Research	$000,000	$110,000	$110,000
TOTAL	$854,100	$1,706,430	$852,330

SUMMARY OF WINTER USE COSTS FOR YELLOWSTONE NATIONAL PARK FOR FACILITIES AND SERVICES

Facilities and Services	Required Budget	Annual Equipment Replacement
Facilities	$12,837,000	$000,000
Transpotation	1,691,800	276,280
Emergency Services	634,000	38,700
TOTAL	$15,162,000	$314,980

[1]Figure is based on 15% materials and supplies costs and annualized replacement costs for Emergency Service Equipment outlined below.
[2]Figure is based on Annualized Replacement Costs for Transportation Services and Miscellaneous Facilities and Services Costs outlined below.
[3]Figure is based on 15% materials and supplies costs.
[4]Estimate is not construction cost.

NATIONAL PARK SERVICE STAFFING NEEDS

Yellowstone National Park's winter staffing is currently funded by diversion of money from summer programs to winter operations. The staffing level is not adequate to provide visitor and resource protection, visitor information and facility maintenance at minimum acceptable standards. Additional staff are required in the divisions of Resource Management and Visitor Protection, Maintenance, and Interpretation.

The tables which follow detail the current level of staffing and the level required to provide high quality operations. The current level and costs reflect the traditional winter use season of early December through late March. These tables do not account for some supervisory personnel in positions which existed prior to rapidly expanding winter use.

Resource Management & Visitor Protection Staffing

Current Level[1]

11 GS-09 Subdistrict Rangers	$85,230
12 GS-07 Park Rangers	76,010
8 GS-05 Park Rangers	40,910
3 GS-04 Park Rangers	13,720
Subtotal	$215,870
Benefits	19,130
TOTAL	**$235,000**

Required Level[2]

11 GS-09 Subdistrict Rangers	$106,540
15 GS-07 Park Rangers	118,760
17 GS-05 Park Rangers	108,410
4 GS-04 Park Rangers	22,980
Subtotal	$356,690
Benefits	33,310
TOTAL	**$390,000**
Shortfall[3]	$155,000

Maintenance Divison Staffing

Current Level[1]

1 Equipment Operator WG-11	$ 8,530
4 Equipment Operators WG-10	32,870
5 Utility Systems Operators WG-10	41,080
2 Water Plant Operators WG-10	16,440
1 Heavy Duty Mechanic WG-10	8,220
1 Automotive Worker WG-08	7,650
1 Motor Vehicle Operator WG-07	9,230
4 Maintenance Workers WG-05	33,780
1 Laborer WG-03	6,140
Subtotal	$155,330
Benefits	14,670
TOTAL	**$170,000**

Required Level[2]

1 Equipment Operator WG-11	$ 10,660
7 Equipment Operators WG-10	71,900
5 Utility Systems Operators WG-10	51,350
2 Water Plant Operators WG-10	20,550
1 Heavy Duty Mechanic WG-10	10,280
1 Automotive Worker WG-08	9,560
1 Motor Vehicle Operator WG-07	9,230
4 Maintenance Workers WG-05	33,780
5 Laborers WG-03	38,380
8 Trades Personnel	76,480
Subtotal	$332,170
Benefits	32,830
TOTAL	**$365,000**
Shortfall[3]	$195,000

Interpretation Division Staffing

Current Level[1]	
2 GS-07 Supervisory Rangers	$ 12,670
6 WG-05 Park Rangers	29,690
Subtotal	$ 42,360
Benefits	2,640
TOTAL	**$ 45,000**
Required Level[2]	
2 GS-07 Supervisory Rangers	$ 15,840
15 GS-05 Park Rangers	84,920
Subtotal	$100,760
Benefits	10,240
TOTAL	**$111,000**
Shortfall[3]	$ 66,000

[1]Current Level: Amount that is currently taken from the summer operation to fund a marginal operation.
[2]Required Level: Amount that is necessary to fund the winter operation at an acceptable level, including an appropriate level of coverage in shoulder seasons.
[3]Shortfall: Amount that winter program is currently underfunded, in addition to item 1.

FACILITIES AND SERVICES

FACILITIES

The impacts of an evolving winter program are probably most evident in the deficiencies that exist in the park's facilities - both visitor and employee facilities. This section details the improvements needed in park facilities. All cost estimates are net and tentative pending additional planning and design.

Remodel or replace Snowlodge (includes eating facility to replace 4 Season Snack Shop)	$4,800,000
Warming huts improved at Canyon and Madison, and new warming hut (portable) at Fishing Bridge	450,000
Upgrade Old Faithful Visitor Center	500,000
Winterize contact station at South Entrance	200,000
Properly designed employee housing	1,997,000
Community gathering and exercise centers (7 @ $110,000)	770,000
Employee vehicle storage at entrances and snowmobile storage in employee housing area (60 spaces parkwide @ $12,000)	720,000
2 75-cu yd garbage compactors @ $100,000	200,000
Winterization or replacement of Grant Village Ranger Station	200,000
Snowmobile and snowcoach staging area near Mammoth Terraces parking area	750,000
Related Planning and design costs	2,000,000
Old Faithful maintenance storage and repair building	250,000
TOTAL	**$12,837,000**

TRANSPOTATION SERVICES

This section itemizes equipment purchases needed to support quality winter transportation operations. Under current concessions contracts, some concessioner operated equipment will be partially or completely funded by the National Park Service. All itemized costs are one-time costs. Annualized equipment repair/replacement costs for all equipment are grouped into a section at the end of this Appendix.

1 Snowroad groomer @ $110,000	$ 110,000
3 Snowblowers @ $20,000	60,000
4 Loader-mounted snowblower attachments @ $29,000	116,000
13 Double-track snowmobiles @ $4,500	58,500
32 Single-track snowmobiles @ $3,500	112,000
10 Fold-a-sleds @ $180	1,800
70 Helmets @ $300	21,000
25 Snowmobile suits @ $100	2,500
22 Snowcoaches @ $110,000 (half at government expenses)	1,210,000
TOTAL	**$1,691,800**

EMERGENCY SERVICES

This section itemizes equipment purchases needed to support emergency medical service, search and rescue, and fire protection operations. All itemized costs represent one-time costs. Annualized equipment repair/replacement costs for all equipment are grouped into a section at the end of this Appendix.

2 Oversnow ambulances @ $45,000	$ 90,000
10 Search and rescue caches @ $5,000	50,000
2 Full-size oversnow vehicles @ $45,000	90,000
Fire protection systems is structures not adequately protected and snow sheds for active fire hydrants	360,000
2 Trailer with pumps and water tanks @ $12,000	24,000
4 Sleds with pumps and water tanks @ $5,000 (to be pulled by double-track snowmobiles)	20,000
TOTAL	**$634,000**

ANNUAL COSTS

As equipment wears out, it needs to be replaced. Annualized replacement costs for Transportation and Emergency Services equipment appear below. Additionally, annual cost estimates for power, fuel, equipment, and maintenance materials and supplies appear in the final table.

Transportation Annualized Equipment Costs

8 Snowroad groomers @ $110,000 on a 8-year cycle	$110,000
5 Snowblowers @ $20,000 on a 10-year cycle	10,000
4 Loader-mounted snowblowers attachments on a 10-year cycle	11,600
22 Double-track snowmobiles @ $45,000 on 7-year cycle	14,150
90 Single-track snowmobiles @ $3,500 less $750 (sale of used machines) on a 2-year cycle	$123,750
30 Fold-a-sleds @ $180 on a 5-year cycle	1,080

Emergency Services Annualized Equipment Costs

2 Oversnow ambulances @ $45,000 on a 10-year cycle	$ 9,000
10 Search and REscue Caches @ $5,000 on a 10-year cycle	5,000
2 Full-size oversnow vehicles @ $45,000 on a 10-year cycle	9,000
2 Trailers with pumps and tanks @ $12,000 on a 20-year cycle	1,200
4 Sleds with pumps and tanks @ $5,000 on a 20-year cycle (to be pulled by double-track snowmobiles)	1,000
SUBTOTAL	$25,200

Miscellaneous Facilities and Services Costs

Groomer parts and contracted repairs	$ 35,800
Snowmobile parts and contracted repairs	16,200
Equipment fuel	25,000
Power	204,750
Buidling fuel	42,000
Materials and supplies	16,500
SUBTOTAL	$340,250
TOTAL ANNUAL SUPPORT COSTS REQUIRED	**$641,730**
Current Funding Level	$364,100
Shortfall	$277,630

page 55 is blank

APPENDIX 3

RESEARCH AND RESOURCE MONITORING NEEDS

A resource protection and monitoring program needs to be developed to guide management of winter use in Yellowstone. In order to develop this program, research is needed to determine what resources are being affected, to what extent, and how such impacts can be avoided. Much research exists pertaining to impacts of winter recreational use on the environment; these studies need to be examined closely to extrapolate information relevant to Yellowstone. Additional field studies may also be needed to identify how Yellowstone's resources are being impacted. Long-term monitoring of human and wildlife use of specific areas may be part of the developed management guidelines. An annotated bibliography of studies relevant to Yellowstone has been started. Additionally, the following specific research and resource monitoring needs have been identified:

Sociological data:

-A review of pertinent literature relative to visitor perceptions.
-On-going snowmobile use survey of traffic patterns and attitudes.
-Monitoring of skier/snowshoer numbers, distribution and attitude.

Wildlife-recreational user impact studies:

-Continuation of skier-wildlife response studies (begun by Cassirer in 1985 for the northern range). Research needs to be conducted in the park's interior, particularly in the Old Faithful area.
-Foot travel impacts on large mammals and birds.
-Snowmobile and motor vehicle impacts on large mammals.

Continued monitoring of distribution and population of large mammals and wintering sensitive birds.

Baseline data relative to skier use in areas where use is growing, such as on the west side of the Gallatins.

Continuation of ecological research conducted on ungulate and habitat relationships (example: DelGuidice begun in 1987).

Wolf restoration efforts need to address winter use, including identification of specific areas where extra protection may be necessary. Use of man-made travel routes (the road system and groomed ski trails) might alter the natural predator-prey relationship.

On-going snow surveys to monitor long-term weather trends.

On-going air quality and visibility monitoring in order to maintain year-round monitoring of air quality trends.

page 57 is blank

APPENDIX 4

SENSITIVE AREAS AND CURRENT MANAGEMENT MEASURES

Sensitive areas are areas where either current or potential winter use could result in resource impacts or safety problems that would require management action. Management measures are implemented according to the Resource Management section of the plan. Areas are organized counterclockwise around the Grand Loop, starting from the North Entrance.

MAMMOTH AREA

S1 McMinn Bench/Target Range Flats. Critical winter range for bighorn sheep. Continue to restrict visitor use during the winter and breeding season.

S2 Boiling River Hot Springs. Because of damage to thermal resources and visitor safety problems, this area receives frequent patrol to enforce restrictions placed on hours of use and a ban on food and beverages.

S3 Mammoth Hot Springs Terraces. Potential damage to thermal resources and visitor safety problems from off-trail travel and icy boardwalks. Signs are posted prohibiting off-trail travel and warning visitors about icy boardwalks. Boardwalks and steps are maintained for safe walking. Ski trails that leave the loop drive are marked and signs are posted prohibiting off-trail travel.

S4 Howard Eaton Trail from Terraces to Golden Gate. Dangerous trail because of avalanche slopes and cliffs. Measures such as warning signs, restrictions to uphill travel only, snowshoes only, or closure are possible.

S5 Bunsen Peak Road Ski Trail. Dangerous curves with drop-off requires signing and/or safety barrier.

S6 Gardners Hole/Swan Lake Flat. Winter range for elk. Observe for possible visitor impacts.

GALLATIN AREA

S7 Northwest Corner. Winter range for elk and moose. Observe for possible visitor impacts.

NORRIS AREA

S8 Norris Geyser Basin. Some elk and bison use. Potential damage to thermal resources and visitor safety problems. Signs are posted prohibiting off-trail travel and warning visitors about icy boardwalks. Observe to determine whether additional management measures are necessary.

S9 Elk Park. Winter range for elk.

S10 Gibbon Geyser Basin. Thermal resources; some elk use.

S11 Gibbon Meadows. Winter range for elk.

S12 Artist Paintpots. Thermal resources. Observe for possible visitor impacts.

WEST ENTRANCE AREA

S13 Duck Creek/Cougar Creek. Winter range for elk. Observe for possible visitor impacts.

S14 Madison River. Winter habitat for waterfowl, elk and bison. Observe for possible visitor impacts.

S15 Seven Mile Bridge. Winter range for elk. Observe for possible visitor impacts.

S16 Madison Junction. Winter range for elk and bison. Observe for possible visitor impacts.

OLD FAITHFUL AREA

S17 Sentinel Meadows. Thermal resources and winter range for elk and bison. Assess visitor impacts to determine management measures needed.

S18 Nez Perce Creek. Winter range for elk and bison. Continue visitor use restrictions and assess visitor impacts.

S19 Fountain Flats. Thermal resources and winter range for elk and bison. Observe for possible visitor impacts.

S20 Fountain Paintpots. Potential damage to thermal resources and safety problems. Signs are posted prohibiting off-trail travel and warning visitors about icy boardwalks. Observe to determine whether additional management measures are necessary.

S21 Firehole Lake Loop Drive. Thermal resources and winter range for elk and bison. Area will remain closed to oversnow and motor vehicle use during winter and spring. Observe for possible skier impacts.

S22 Imperial Geyser. Thermal resources. Observe for possible visitor impacts.

S23 Midway Geyser Basin. Potential damage to thermal resources and visitor safety problems. Signs are posted prohibiting off-trail travel and warning visitors about icy boardwalks. Observe to determine whether additional management measures are necessary.

S24 Rabbit Creek. Thermal resources and winter range for elk and bison. Observe for possible visitor impacts.

S25 Upper Geyser Basin. Winter range for elk and bison, potential damage to thermal resources and safety problems. Signs are posted prohibiting off-trail travel. Maintain boardwalks for safe walking or skiing. Assess visitor impacts to determine whether additional management measures are necessary.

S26 Summit Lake. Thermal resources. Observe for possible visitor impacts.

S27 Lonestar Geyser/Upper Firehole River. Thermal resources and some bison use. Observe for possible visitor impacts.

BECHLER AREA

S28 Ferris Fork and Three Rivers Meadows Thermal Areas. Potential damage to thermal resources from camping and hotpotting. While issuing backcountry permits, rangers will inform visitors of restrictions and the need for care in use of area. Assess visitor impacts to determine whether use restrictions are necessary.

SOUTH ENTRANCE AREA

S29 Shoshone Geyser Basin. Thermal resources. Observe for possible visitor impacts.

S30 Shoshone Lake. Frequently used travel route on ice poses danger to visitors from thin ice caused by thermal activity in the lake. Rangers will warn visitors upon issuance of backcountry permit. Observe for impacts on waterfowl, especially in Lewis River Channel.

S31 Witch Creek. Thermal resources and winter range for elk and moose along the frequently used trail to Heart Lake. Assess visitor impacts to determine whether additional management measures are necessary.

S32 Heart Lake. Thermal resources and winter habitat for elk, moose and waterfowl. Assess visitor impacts to determine whether use restrictions are necessary.

S33 Mt. Sheridan. Slope skiing area is subject to avalanches. Warn visitors when issuing backcountry permits.

S34 Spirea Creek/Crawfish Creek. Potential damage to thermal resources from camping and hotpotting. Assess visitor impacts to determine whether use restrictions are necessary.

S35 Thorofare Area. Winter range for moose and some elk. Observe for possible visitor impacts.

WEST THUMB AREA

S36 West Thumb Geyser Basin. Potential damage to thermal resources and visitor safety problems. Post prohibition of off-trail travel and warning of thin ice on lake. Maintain boardwalks and steps for safe walking.

S37 Potts Basin. Fragile and dangerous thermal area shall remain closed year round.

LAKE VILLAGE AREA

S38 Yellowstone Lake. Thin ice caused by thermal activity in the lake can make foot travel dangerous. Warn visitors when issuing backcountry permits.

S39 Pelican Valley. Winter range for elk and bison. Observe for possible visitor impacts.

S40 Yellowstone River from lake outlet to Canyon. Winter habitat for waterfowl and bison. Observe for possible visitor impacts.

CANYON AREA

S41 Mud Volcano Area. Potential damage to thermal resources and visitor safety problems; winter range for bison. Signs are posted prohibiting off-trail use and warning visitors about icy boardwalks. Observe to determine whether additional management measures are necessary.

S42 Hayden Valley. Winter range for bison. Observe for possible visitor impacts, particularly at Sulpher Mountain. Continue restriction on travel over Mary Mountain to Old Faithful (see S18 Nez Perce Creek).

S43 Grand Canyon of the Yellowstone. Foot travel along the rims is dangerous. The falls and canyon walls are visual resources that could be impacted by ice and snow climbing. Maintain some overlooks for safe walking. Provide accurate information in the form of a ski trail map on safe areas for skiing. Continue year-round closure of the Canyon below the rims to off-trail foot travel.

S44 Washburn Range. Slope skiing can be dangerous because of avalanches. Post warnings and warn overnight campers when issuing backcountry permit.

NORTHERN RANGE AREA

S45 Lamar River/Slough Creek/Lower Soda Butte Creek. Winter range for elk and bison. Observe

for possible visitor impacts. Assess visitor impacts along Slough Creek to determine whether use restrictions are necessary.

S46 Yancey's Hole/Pleasant Valley. Winter range for elk and bison. Assess visitor impacts to determine whether use restrictions are necessary.

S47 Blacktail Deer Creek. Winter range for elk and bison. Assess visitor impacts to determine whether use restrictions are necessary.

S48 Tower Falls, the falls are a visual resource that could be impacted by ice and snow climbing.

APPENDIX 5

SNOWROAD GROOMING AND SIGNING GUIDELINES

GROOMING

The following responsibilities and standards apply to all times when park snowroads are open to the public. During times of administrative travel only, maintenance and signing standards may be lower. Area winter maintenance plans will designate all snowroads, parking areas, pullouts and wayside exhibits to be groomed.

Responsibilities

The District Ranger, in consultation with the District Maintenance Supervisor, will be responsible for determining the condition of the snowroads; opening and closing snowroads; and reporting openings, closings and conditions to the Communications Center daily and as changes occur. The District Maintenance Supervisor will ensure that areas identified in area maintenance plans are groomed to the standards below.

Standards

Two-way road width will be sufficient for snowcoaches traveling in opposite directions to pass each other safely at cruising speed. One-way road width will be sufficient for snowcoach travel. Where parallel ski trails are feasible and called for under the ski trail maintenance standards, sufficient width will be left for such trails outside the berm created by grooming.

Snowroads will be marked with snowpoles at intervals sufficient for travelers to determine the location of the snowroad in all but the most severe white-out conditions.

As much as possible, grooming should be done when snow conditions and air temperature are most favorable for good results and minimal wear on equipment. Where feasible, grooming should be done when visitors are less likely to be using snowroads.

Groomers will be stationed and snowroad segments will be assigned to groomers so that, as much as possible, segments in the worst condition can be groomed at the best time of day and receive extra attention, if necessary.

For ease of snow removal in the spring, grooming in the developed areas will be limited to those roads absolutely necessary for visitor and employee travel. Routes to fire hydrants and hose houses, however, should be packed for easy access in the event of a fire.

SIGNING

Responsibilities

The District Ranger will be responsible for determining all winter sign needs, for requesting necessary signs, and for placing and maintaining all seasonal, temporary and changeable signs (signs that are less than seasonal or require updating as roads and services open and close). The District Maintenance Supervisor will ensure that all signs necessary for winter use are in place and maintained. Signs will be kept clear of snow by all NPS employees.

Standards

All snowroad signs will conform to Yellowstone's sign standards. Signing of snowroads will be comparable to signing of park roads in summer. All regulatory and warning signs apply to snowmobiles and must be visible or separate winter signs must be placed. Guide signs (directional and informational) will be kept clear

of snow. Additional signs will be placed at all intersections and wherever necessary to direct visitors to all available services and all accessible areas of the park. Guide signs that are not applicable will be removed and properly stored or covered Guide signs that are changeable or partially applicable will be maintained and updated according to the park sign manual.

APPENDIX 6

WINTER ROAD MAINTENANCE AND SIGNING GUIDELINES

MAINTENANCE

All roads, parking areas, pullouts and wayside exhibits to be plowed will be specified in area winter maintenance plans. Areas to be plowed may vary depending on expected visitation in the various seasons.

Responsibilities

The District Ranger, in consultation with the District Maintenance Supervisor, will be responsible for determining the condition of roads; opening and closing roads; and reporting openings, closings and conditions to the Communications Center on a daily basis and as changes occur. The District Maintenance Supervisor will ensure that areas identified in winter maintenance plans are plowed to the standards below.

Standards

Icy areas on curves and hills will be sanded when determined dangerous by the District Maintenance Supervisor and District Ranger.

After spring plowing, wood chips will be windrowed as far to the edge of the road as possible, and will be removed as soon as possible. Warning signs will be placed at both ends of the windrow piles.

Before opening roads to the public in the spring, all floor ice will be removed.

SIGNING

Responsibilities

The District Ranger will be responsible for determining all winter sign needs, for requesting necessary signs, and placing and maintaining all seasonal, temporary and changeable signs (signs that are less than seasonal or require updating as roads and services open and close). The District Maintenance Supervisor will ensure that all signs necessary for winter use are in place and maintained. Signs will be kept clear of snow by all NPS employees.

Standards

All road signs will conform to Yellowstone's sign standards.

Summer warning and regulatory signs that remain in place must be visible or separate winter signs must be placed. Guide signs (directional and informational) that apply in winter and the shoulder seasons will be kept clear of snow. Guide signs that are not applicable will be removed and properly stored or covered.

A warning sign will be placed at the beginning of each segment of the Grand Loop Road where frost heaves and broken pavement occur (e.g., "FROST HEAVES - NEXT 51 MILES"). Individual heaves and breaks will be marked with a fluorescent orange diamond sign. After spring plowing, remaining wood chip windrows will be marked with warning signs.

page 65 is blank

APPENDIX 7

PATH, BOARDWALK AND OVERLOOK MAINTENANCE GUIDELINES

RESPONSIBILITIES

All paths, boardwalks and overlooks to be maintained for safe foot travel in winter will be located in developed or threshold areas and will be specified in area winter maintenance plans. The District Maintenance Supervisor inconjuction with the District Ranger will ensure that designated paths, boardwalks and overlooks are maintained to the standards below.

STANDARDS

Snow will be cleared or packed to the point that a flat, firm surface is established. Where there are steps, snow will be cleared to within two inches of the tread. The full width of a walk need not be cleared, but where there are handrails, the path will be cleared adjacent to the handrail and to a depth where t e handrail is effective. Overlooks will be cleared to the point that safety railings are effective. Transitions fr m cleared surfaces to packed surfaces will not exceed on.e foot in height.

Machines (snowblowers) may be used to accomplish the maintenance described above. Howe machine use will be scheduled and accomplished in such a way as to minimize visitor conflict. Machi blowing snow will not impact fragile microbial matts and thermal areas adjacent to maintained paths.

SIGNING

Summer signs will be used as much as possible and should be kept clear of snow or replaced with signs that can be kept clear of snow. Features signed in summer and visible in winter should be signed in winter.

page 67 is blank

APPENDIX 8

SKI TRAIL DEVELOPMENT AND MAINTENANCE GUIDELINES

POLICY

Cross-country ski trails in Yellowstone National Park serve the same functions as summer hiking trails. They provide a means of access to natural features and scenic areas and a way for visitors to enjoy the park. All designated ski trails will be specially signed, mapped and graded according to difficulty. Ski trails will be improved and/or rerouted as necessary to meet safety standards implied by difficulty ratings.

Packed and tracked trails not only make skiing easier and more enjoyable, but also help channel visitors in areas where dispersed travel could impact wildlife. Snowmobiles and track-setting sleds may be used on specified ski trails within threshold areas that meet the criteria set forth in this appendix. [Footnote: For the definition of threshold area, see Management Zones section of this plan. Proposed wilderness will not be designated threshold.] Trails will be packed and tracked only after heavy snowfalls and when tracks have been badly damaged.

The National Park Service will attempt to maintain a consistent level of trail maintenance throughout the park and will provide information to visitors on trail conditions.

Popular backcountry trails not designated as maintained ski trails may be improved for safer winter travel, but will not be packed, tracked or maintained for skiing, and will be clearly distinguished from designated ski trails. Information on skiable backcountry trails will be available for visitors who wish to break their own trails.

Signing standards for designated ski trails in threshold areas are set forth below. Mapping standards are contained in Appendix 9. Backcountry trails not designated as maintained ski trails will not be specially signed or mapped.

TRAILS

Ski trails that lie on hiking trails will be improved and rerouted for safe skiing. Clearance will be 8' wide by 10' high (horse trail standard). Gradients will meet standards set in Yellowstone's *Trail Construction and Maintenance Guide*. Curves will be negotiable with step-turn or snowplow technique at the rated difficulty level. Side-hilling where no trail exists should be minimized.

New ski trails (1) will be developed as needed; (2) will provide access to natural features or scenic areas, or connect existing trails; and (3) will not impact wildlife. Each new ski trail will be reviewed in the same manner that new summer hiking trails are reviewed. Visual resources should be protected when developing any new trail.

MACHINE TRACK-SETTING

As a general rule the only ski trails that will be machine tracked are those that lie on a road or path open to administrative or visitor motor vehicle use during the summer. Exception to the General rule will be approved by the Superintendent.

SIGNING FOR DESIGNATED TRAILS

All trailheads and junctions of designated ski trails will be marked with special signs that meet Yellowstone's sign standards. A ski trail map will also be posted at each trailhead. Trail names will be used on all trailhead signs and maps.

Ski trails will be clearly marked with the standard orange tree tags and meadow markers, which should be

placed so that they will be visible with expected snow depths and loading of tree limbs. Where the ski trail diverges from a summer hiking trail or abruptly changes direction, the ski trail will be marked with the international skier symbol and/or appropriate arrows. All ski trail signs and symbols will be in place during the ski season only.

FACILITIES

Toilets, interpretive exhibits and simple shelters with wood stove and emergency supplies are the only facilities that may be associated with designated ski trails.

APPENDIX 9

SKI TRAIL MAP STANDARDS

In an effort to standardize Yellowstone ski maps, the following criteria have been established:

All maps will be printed on white paper, 11.5 by 17 inches, folded to 3.75 by 8.5 inches.

Maps will be overprinted on a base that includes the park logo, map legend and generic text on skiing, wildlife and safety. The map title, headings, ski trail names, ski trail routes and park address should be printed in blue, the park's winter color. For simplicity, all other information should be printed in black.

Trails will be rated as "easiest," "more difficult," or "most difficult," and, where appropriate, different sections of a single trail may have different ratings.

Symbols to be used:

Easiest: ..... (blue)
More Difficult: -.-.-.-.- (blue)
Most Difficult: - - - - - - (blue)
Backcountry Trail: - - - - - - (black, thin)
Plowed Road: shading between parallel thin black lines
Snowroad: parallel thin black lines
Parking: P
Shuttle Stop: stylized picture of bus or snowcoach as appropriate
Ski Hut: cross section of a three-sided shelter
Thermal Feature or Mountain Summit: solid square box Pass:)(
All other features will use standard symbols

The generic language for all maps will include a prominent statement that all trail mileages are "one way." Total trail distance will be given (to the nearest tenth) in the heading of the description for each trail.

Elevations of significant features will be shown on maps. Elevations of the highest and lowest points on the trail will be shown where significant.
Shuttle schedules should not be included as they change too frequently. Each map may describe how to arrange shuttles where they are available.

Headings will contain trail name, trail rating(s), distance, and starting elevation or elevations of highest and lowest points where significant.

Trail names on maps will correspond exactly with those on signs. All signed features shown on map or referenced in text will also correspond exactly.

Descriptions should be concise especially where the route is not obvious. The word "CAUTION" in bold will flag all warnings in text. The terrain of each segment should be described briefly with words such as "mostly level," "steep climb," "through alternate woods and meadows," etc. Noteworthy scenic features and wildlife viewing opportunities should be mentioned. Significant climbs and descents should be described in terms of both vertical and horizontal distance, e.g., "climbs 500 feet in 1.5 miles. "Suggestions for making a route easier, such as skiing a loop in a particular direction, may be included. Overlapping trail descriptions should be avoided.

Page 71 is blank

APPENDIX 10

BACKCOUNTRY PROCEDURES AND WINTER CHECKLIST

BACKCOUNTRY PROCEDURES

Yellowstone National Park offers a variety of backcountry experiences for the skier and snowshoer. Party size and length of stay will be regulated to ensure that physical impacts of sanitation, trash and snow shelters are kept to a reasonable level. There will be a turnover of camping areas so the number of parties in an area can be maximized. In no case will parties exceed 14 days or 20 persons. Maximum party size and length of stay will be regulated by restrictions for designated campsites.

With the exception of Mammoth Campground, backcountry permits will be issued for all camping in the park. Each permit must be given by an area ranger. Visitors will be required to sign a checklist (below) to show that they have received and understood all necessary regulations and safety information.

Threshold Areas

Camping in threshold areas can only occur in designated areas. Specific areas may be designated by the District Ranger and no party may stay longer than three nights in a campsite. At a minimum, vault toilets are required in any designated winter campground in threshold areas.

Backcountry Areas

Campsite listings and specified regulations will be available at designated backcountry offices.

Fires

In order to reduce impacts, the building of ground fires will only be permitted within established frontcountry fire grates or fire rings within specifically designated campground and campsites. These sites will be located in areas in which either dead and down wood may easily be found (without extensive shoveling of snow) or where firewood may be purchased from a concessioner. Reasons for this policy are:

Due to snowcover, the usual sources of dead and down wood are buried. This leads to the use of limbs from standing live and dead trees.

Charred wood accumulates in areas outside of fire rings within camp-sites and "in the middle of nowhere" at undesignated or winter-only designated sites.

Technical Climbing, Mountaineering and Ice Climbing

Visitors will be allowed to engage in these recreational activities without special use permits. Check-in and check-out by these parties is encouraged. A backcountry permit is required for all overnights. These activities are currently prohibited in the area surrounding the Grand Canyon of the Yellowstone River. Additional restrictions on these activities may be placed in any developed or threshold zone or within view of any major scenic area or from any roadway.

WINTER CHECKLIST

The following warnings are to be given when issuing a backcountry permit and are to be checked off on the WINTER CHECKLIST form (YELL 371, attached).

Bears

Yellowstone is bear country. Because bears have been seen every season,the following information must

been given to all campers:

Food Storage. Food should be in plastic bags out of reach of bears, at least 10 feet off the ground and 4 feet from a tree trunk.

Encounters. Bear behavior varies. Discuss the different strategies that should be used if a bear is encountered.

Camp Setup. Sleeping areas should be at least 100 feet from cooking areas. All scented articles (soap, etc.) should be stored with food items.

No Fires/Stoves Needed

Ground fires are not permitted in areas requiring a backcountry permit because dead and down wood, the only fuel source available for fires, is buried beneath the snow. Fire builders would hence be tempted to take limbs from standing trees. Additionally, campfire rings in designated summer camping areas are buried underneath the snow, preventing their use. Fires built on top of the snow would accumulate charred wood and leave scars.

Sanitation/Garbage

All human waste should be buried a minimum of 100 feet from water and out of sight from all trails and campsites. Toilet paper should be burned or packed out with ALL other trash.

Pets/Firearms/Motors

Pets, firearms, and motorized vehicles are NOT allowed in the backcountry.

Water - Purify

Backcountry water may contain the Giardia protozoa. There is a chance of contracting Giardiasis. Be safe and boil all water before using.

Vehicle Security

Lock all doors and leave nothing in view that might entice someone to break into a vehicle.

Current Weather and Snow Conditions

Backcountry users should be informed of current weather report and snow conditions on planned route of travel.

Equipment and Clothing

Clothing of several adjustable layers enables overnight users to be prepared for changing conditions. Campers should know the three most important layers and be sure to have extra items for weather changes.

Overnight winter trips require special equipment, and ALL parties should carry the following: matches/lighter, extra clothing, first-aid kit, map and compass, food and water, equipment repair parts, and tools. Overnight users will also need a stove for cooking and a shovel for obtaining water.

River/Lake Crossings

River and lake crossings may appear safe and easily accomplished but may actually be dangerous. Advise users of potential problems.

Avalanche Danger

Heavy, fresh snowfall, high winds, or extreme temperature changes may cause avalanches. Inform backcountry users of possible dangers on planned trails.

Frostbite

Frostbite is the actual freezing of a body part. Most often the hands, feet, face, and ears. Campers should know the symptoms and treatments.

Thermal Features

Be aware of overhanging snow ledges, thin crusts, and icy patches leading to or around such areas.

Natural Objects

Natural objects, including rocks and antlers, should be left where found for the enjoyment of others.

Hypothermia

Beware of hypothermia - the lowering of the body's core temperature. Know the symptoms and treatments. Watch out in any wet, windy and cold weather.

Wildlife/Safety

Never approach wildlife too closely and always try to keep an obstacle between you and them. To keep smaller animals out of your equipment, be sure to store food properly in a nearby tree.

SPECIAL WARNINGS, SPECIAL CONDITIONS

This space should be used for any special warnings, conditions, or dangers the backcountry users may experience during their trip. Additional information, including any opinions or recommendations issued, may also be included.

SKIING ETIQUETTE (not on checklist)

Be sure to repair tracks when you fall, snowshoe to the side of tracks, and caution others when skiing downhill to avoid collisions.

YELL-371
12/85

YELLOWSTONE NATIONAL PARK - WINTER CHECKLIST

Leaders Name _____ # in party _____
Home Phone # _____ work # _____

Vehicle (s) description/License # _____
Vehicle(s) parked at _____

Party travelling by ski _____ Snowshoes _____

Person for emergency contact _____
Address _____
Home phone # _____ work # _____

Travel route (general) from (entry location) _____
_____ to (exit location) _____

Names of others in party _____
_____

Additional information _____
_____

****

PERMIT CHECKLIST

Date _____ Issued by _____ Permit # _____

1. _____Bears
   Food Storage
   Encounter
   Camp setup
2. _____No fires/stoves needed
3. _____Sanitation/garbage
4. _____Pets/firearms/motors
5. _____Water - purify
6. _____Vehicle security
7. _____Current weather
8. _____Snow conditions
   _____Special warnings
9. _____Equipment & Clothing
   Layers
   Wind Protection
   Emergency Equipment
10. _____River/lake crossings
11. _____Avalanche danger
12. _____Frostbite
13. _____Thermal features
14. _____Natural objects
15. _____Hypothermia
16. _____Wildlife/safety
    _____Special conditions:

_____

I have been informed of the above checked items, and I agree to observe and to comply with all requirements.

Signature _____

Address _____

_____DOB_____

APPENDIX 11

COMMERCIAL USE PERMITS AND CONDITIONS

The Commercial Use License for operating guided services during the winter season in Yellowstone is valid from December through March. A license fee and verification of liability insurance covering bodily injury and property damage are required to obtain a license. Each license is granted subject to a list of conditions regulating commercial use industries. The current commercial use license along with conditions for ski touring, snowcoach tours and snowmobile tours are found below

YELLOWSTONE NATIONAL PARK
COMMERCIAL USE LICENSE

CL:570_____

In accordance with National Park Service regulations as contained in CFR Title 36, Chapter 1, Section 5.3, permission is granted to:

_____:
(Name/Business Name)

_____
(Address)

to conduct the following commercial guide service activities:

_____
(backpacking, horse, fishing, ski touring, etc.)

in_____area of Yellowstone National Park,
(specific area)

subject to the attached conditions, during the period from_____ through_____.

The license is granted subject to the following conditions:

1. The licensee and all participants authorized herein must comply with all of the conditions of this license and with all directions of the Park Superintendent. The licensee must have obtained all permits or licenses of state or local governments as applicable, necessary to conduct the commercial activities specified above.

2. The area(s) authorized for use under this license must be left in substantially the same condition as it was prior to the activities authorized herein, and all refuse shall be placed in the trash containers provided, or disposed of as otherwise required by the Superintendent. The licensee shall be liable for any damages to property of the United States resulting from the activities authorized hereunder.

3. This license is applicable only for the use of the area(s) and term designated above.

4. It is expressly agreed and understood that this license does not authorize the licensee to advertise, solicit business, collect any fees, or sell any goods or services on lands owned and controlled by the United States.

5. The licensee shall save, hold harmless, and indemnify the United States of America, its agents and employees for losses, damages, or claims for personal injury, death, or property damage of any nature whatsoever and by whomever made, arising out of the activities of the licensee, and his employees or agents under the license.

6. NONDISCRIMINATION - See Attachment A.

7. CONSTRUCTION - No temporary building, permanent building, or permanent structure shall be erected under this license.

8. ASSIGNMENT - This license may not be transferred, extended or assigned under any circumstances.

9. REVOCATION - This is expressly understood and agreed that this license may be revoked at any time at the discretion of the Superintendent without compensation to the licensee or liability to the United States.

10. GENERAL PROVISIONS - (a) Operations under this license shall be subject to the laws of Congress governing the area and rules and regulations promulgated thereunder, whether now in force or hereafter enacted or promulgated; provided, however, that this license does not constitute a concession contract or permit within the meaning of 16 U.S.C. 20 et seg., and, specifically, that no preferential right of renewal attaches to this license.

(b) Reference in this license to "Superintendent" shall mean the Service official executing this license and the term shall include his duly authorized representatives, and reference to "Service" herein shall mean the National Park Service.

(c) No member of, or delegate to, Congress shall be admitted to any share or part of this license or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this license if made with a corporation or company for its general benefit.

(d) The licensee will be required by the Superintendent to submit annually, but not later than thirty (30) days after December 31 each year, an annual statement of operations summarizing visitor use for the year (in-park operations only).

(e) The licensee is subject to any and all special conditions attached hereto.

11. NON-EXCLUSION AUTHORIZATION - This license shall not be construed as limiting the obligations of the Superintendent to issue similar licenses at the request of all other persons seeking to conduct the same or similar activities in the area.

_____

Licensee date

Issued at Yellowstone National Park this_____day of_____.

_____

Dan R. Sholly
Chief Ranger
Yellowstone National Park

YELL-493
11/87

Continuation of Commercial Use License for Ski Touring

Ski touring, snowshoeing, or other foot travel in the thermal basins will be restricted to established trails or as designated by the District Ranger.

Towing skiers behind motorized vehicles is prohibited.

The licensee shall be responsible to see that all members of his group are safely equipped and properly clothed prior to the trip.

All accidents must be reported to a ranger station as soon as possible.

Supplying of any party by air drop is prohibited.

The licensee shall carry a minimum of $300,000 of insurance for bodily injury and property damage per person, per accident.

One employee on each trip shall be trained in first aid. A basic, 24-unit first aid kit will be carried as a minimum supply by each party.

The licensee will pay the unusual cost for any search and rescue the National Park Service conducts on their behalf. (Unusual costs are helicopter and fixed-wing aircraft.)

The possession and use of firearms in the park is prohibited.

A backcountry use permit is required for overnight use and is available at any ranger station. Campsites must be located at least 100 feet from permanent streams.

The licensee must comply in full with the information provided in "Beyond Road's End".

The licensee must register each party at the trailhead registration boxes.

The use of motorized equipment in the backcountry is specifically prohibited.

Pack out all trash and dispose of human waste properly. Latrine facilities must be a minimum of 100 feet from all water sources and out of sight from trails and campsites. Burn toilet paper on top of the snow.

Wood fires are not allowed except in designated front country campgrounds.

When the campsite is dismantled, all snow structures must be destroyed and the area left in a natural state.

Violation of any park regulations or terms of this license will result in the suspension of privileges granted by this license.

YELL-483
11/87

Continuation of Commercial Use License for Snowcoach Tours

The term snowcoach shall include any device propelled by a motor that is designed for oversnow travel as a common carrier.

The use of snowcoaches is allowed on designated routes only.

Snowcoaches operating in the park must be equipped with headlights and taillights which must be lighted from a half-hour after sunset to a half-hour before sunrise, or at any other time when visibility is not clearly discernible for a distance of 500 feet.

The licensee shall communicate travel plans to the park communication center, (307) 344-7381 and report destination travel.

It is the responsibility of the licensee to ensure that all members of his group are safely equipped and properly clothed prior to the trip.

The licensee shall be responsibile for the prompt and appropriate retrieval of clients and equipment in the event of a breakdown or accident.

All accidents shall be reported to a ranger station as soon as possible.

The licensee shall carry a minimum of $300,000 of insurance for bodily injury and property damage per person, per accident.

One employee on each trip shall be trained in first aid. A basic, 24-unit first aid kit must be carried as a minimum supply by each party.

The licensee will pay the unusual cost for any search and rescue the National Park Service conducts on their behalf. (Unusual costs are helicopter and fixed-wing aircraft.)

The possession and use of firearms in the park is prohibited.

The licensee shall make certain that all members of the party are informed of park rules and regulations.

Violation of any park regulation or terms of this license may result in the suspension of privileges granted by the license.

YELL-494
11/87

Continuation of Commercial Use License for Snowmobile Tours

The term snowmobile shall include any device propelled by a motor that is designed for oversnow travel.

The use of snowmobiles is allowed on designated routes only.

The towing of skiers or sleds behind motorized vehicles is prohibited.

Snowmobiles operating in the park must be equipped with a headlight and taillight which must be lighted from a half-hour after sunset to a half-hour before sunrise, or at any other time when visibility is not clearly discernible for a distance of 500 feet.

Persons under the age of 16 shall not operate a snowmobile unless under the direct supervision of a person 21 years of age or older who may not supervise the snowmobile use of more than one person under 16 years of age at any one time.

The licensee shall make certain all members of the party follow all park rules and regulations as well as the Code of Federal Regulations.

The licensee shall be responsible to see that all members of his group are safely equipped and properly clothed prior to the trip.

All accidents must be reported to a ranger station as soon as possible.

The licensee shall carry a minimum of $300,000 of insurance for bodily injury and property damage per person, per accident.

One employee on each trip shall be trained in first aid. A basic, 24-unit first aid kit will be carried as a minimum supply by each party.

The licensee will pay the unusual cost for any search and rescue the National Park Service conducts on their behalf. (Unusual costs are helicopter and fixed-wing aircraft.)

The possession and use of firearms in the park is prohibited.

A backcountry use permit is required for overnight use and is available at any ranger station. The licensee must comply in full with the information provided in "Beyond Road's End".

The use of motorized equipment in the backcountry is specifically prohibited.

Violation of any park regulations or terms of this license will result in the suspension of privileges granted by this license.

PREPARERS

Steve Iobst
Management Assistant
Yellowstone National Park

Douglas Barnard
Chief Ranger
Grand Teton National Park

Robert S. Brockwehl
Park Planner
Denver Service Center

Judy Churchwell
Concessions Management Specialist
Yellowstone National Park

Susan L. Consolo
Management Biologist
Yellowstone National Park

Janet H. Ellis
Editor
Yellowstone National Park

William Hape
Assistant Chief of Maintenance
Yellowstone National Park

Tim Hudson
Chief of Maintenance
Yellowstone National Park

William Laitner
Chief of Interpretation and Visitor Services
North Cascades National Park

Steve Martin
Chief Ranger
Voyageurs National Park

Mary Meagher
Research Biologist
Yellowstone National Park

Jerry Mernin
Snake River District Ranger
Yellowstone National Park

Mike Pflaum
Management Assistant
Yellowstone National Park

page 83 is blank

BIBLIOGRAPHY

Brown, Beulah. 1924. *My Winter in Geyserland*. Beulah Brown, Yellowstone National Park Library.

Chittenden, Hiram M. 1895. *The Yellowstone National Park*. The Robert Clarke Co., Cincinnati.

Darby, Francis T. 1974. "Winter Use Plan, Old Faithful Sub-District, Yellowstone National Park". Unpublished report submitted to the Faculty of the Graduate School Clemson University.

Greater Yellowstone Cooperative Regional Transportation Study. 1978. U.S. Department of the Interior and U.S. Department of Agriculture. U.S. Government Printing Office, Washington.

Halliday, Robert S. 1955. "Yellowstone in Winter". *Parade*, March 13, 1955.

Hamilton, William F. 1957. Memorandum to Superintendent, from William F. Hamilton, Assistant Superintendent, Yellowstone National Park. October 29, 1957.

Kenner, Edwin C. 1958. Memorandum to Director from Edwin C. Kenner, Chief of Maintenance July 1, 1958.

National Park Service. 1972. *Wilderness Recommendation, Yellowstone National Park/ Idaho, Montana, Wyoming*. (NPS 1234).

National Park Service. 1974. *Master Plan, Yellowstone National Park/ Wyoming, Montana, Idaho*. Yellowstone National Park.

National Park Service. 1983. *Natural Resource Management Plan and Environmental Assessment*. Yellowstone National Park.

National Park Service. 1985. *Development Concept Plan, Old Faithful, Yellowstone National Park*. Denver Service Center, Denver, Colorado.

National Park Service. 1985. Yellowstone National Park Winter Checklist (YELL 371). Yellowstone National Park.

National Park Service. 1985. Yellowstone National Park Commercial Use License (YELL 490). Yellowstone National Park.

National Park Service. 1985. *Yellowstone National Park Winter Wayside Exhibit Proposal*. Yellowstone national Park. September, 1985.

National Park Service. 1986. *Statement for Management, Yellowstone National Park* (NPS D152-a). Yellowstone National Park.

National Park Service. 1987. Continuation of Commercial Use License for Ski Touring (YELL 493). Yellowstone National Park.

National Park Service. 1987. Continuation of Commercial Use License for Snowcoach Tours (YELL 483). Yellowstone National Park.

National Park Service. 1987. Continuation of Commercial Use License for Snowmobile Tours (YELL 494). Yellowstone National Park.

National Park Service. 1987. *Yellowstone National Park Winter Wayside Exhibit Plan*. Yellowstone National Park. (November 16, 1987).

National Park Service. 1988. *Annual Bear Management Plan*. Yellowstone National Park.

National Park Service. 1988. *Concessions Management Guideline* (NPS 48). U.S. Department of the Interior, National Park Service, Washington, D.C.

National Park Service. 1988. *Management Policies*. U.S. Department of the Interior, National Park Service, Washington, D.C.

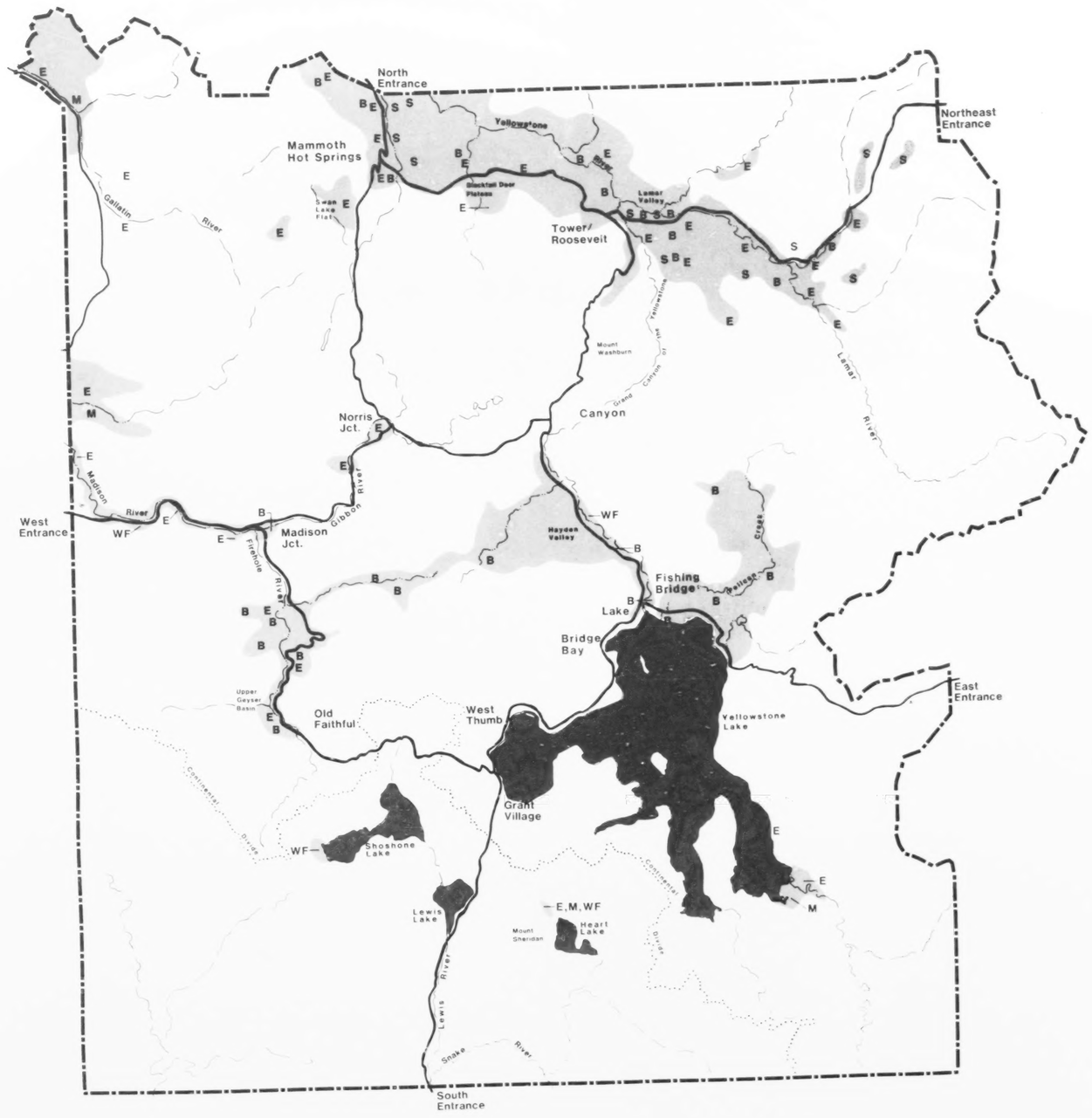
National Park Service. 1988. Yellowstone Backcountry Campsites (YELL 475). Yellowstone National Park. Revised annually.

Paganelli, Linda A. 1980. "The Historical Development of Winter Visitor Use at Yellowstone National Park". Unpublished report submitted to South District Naturalist, Yellowstone National Park. March 12. Yellowstone National Park Library.

Wells, Henry P. 1887. "Winter in Yellowstone Park". *Harper's Weekly*. April 9, 1887.

Whitney, Steven C. 1985. "Winter playground: visitors discover the off-season, putting new pressures on snowbelt parks". *National Parks*. National Parks and Conservation Association. November/December, 1985.

Winter Operation of Roads in Yellowstone National Park. 1968. Senate Hearings, 90th Congress, 2nd Session. U.S. Government Printing Office, Washington, D.C.



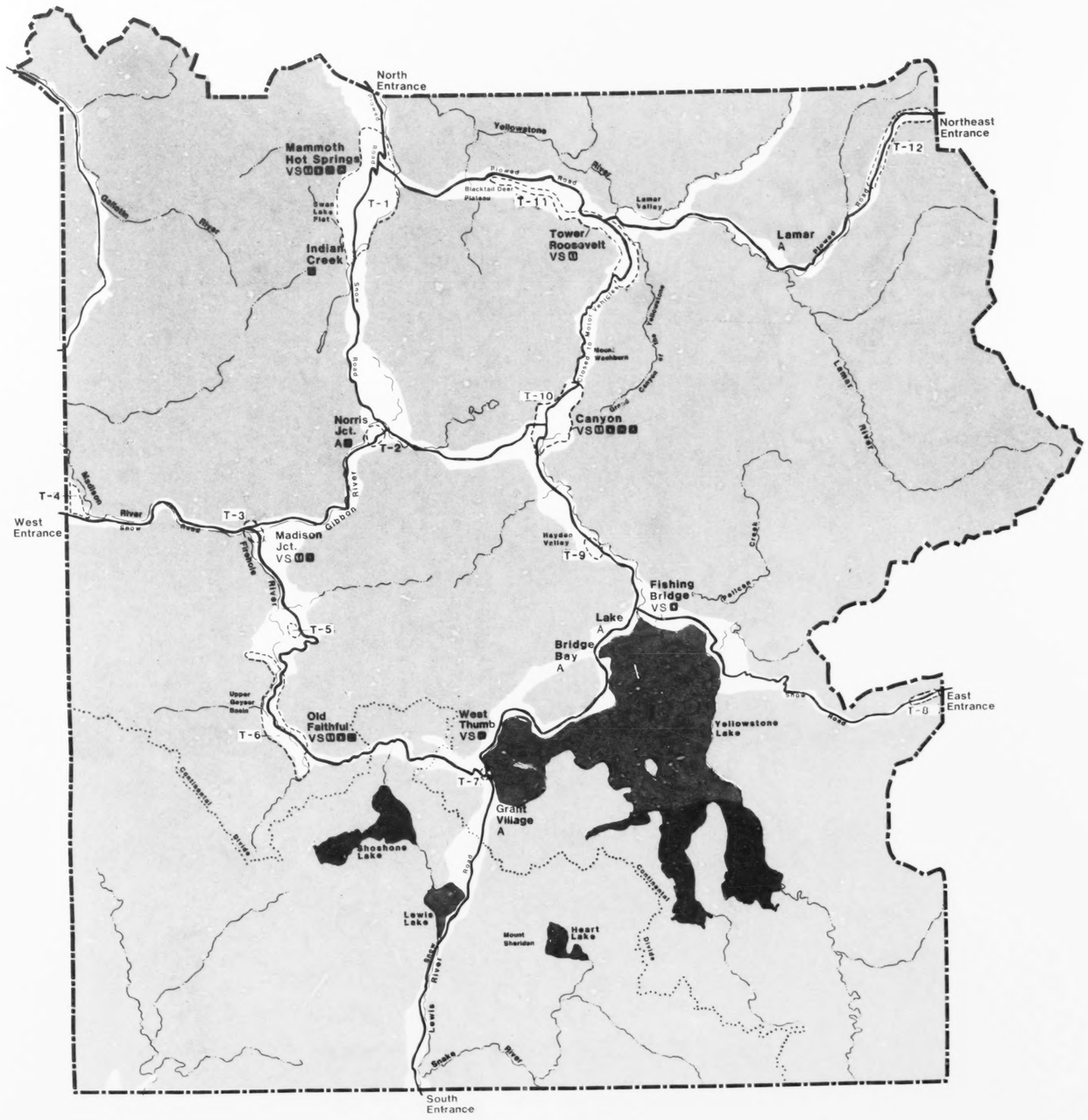
WINTER WILDLIFE HABITAT

Bison	B
Elk	E
Moose	M
Bighorn Sheep	S
Waterfowl	WF

Core Winter Range

Letters within encircled areas indicate dense concentrations of animals within core winter range areas. Letters outside of encircled areas indicate small groups of animals in isolated areas of winter habitat.

Figure 6. Identified critical winter wildlife habitat for Yellowstone National Park.



LAND USE CLASSIFICATION

Visitor Service Area	VS
Food	
Fuel	
Lodging	
Camping	
Warming Hut	
Administrative Area	A
Backcountry	
Wilderness	
Non-Wilderness	
Threshold Area	T-#
T-1 through T-11 see text for description of individual areas	

Figure 7. Land use classification.